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SCIENCES

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18 Prestress design saves money on office building

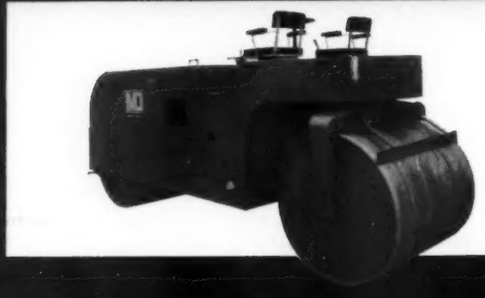
20 One month's work: sixty-two acres of 6-inch paving

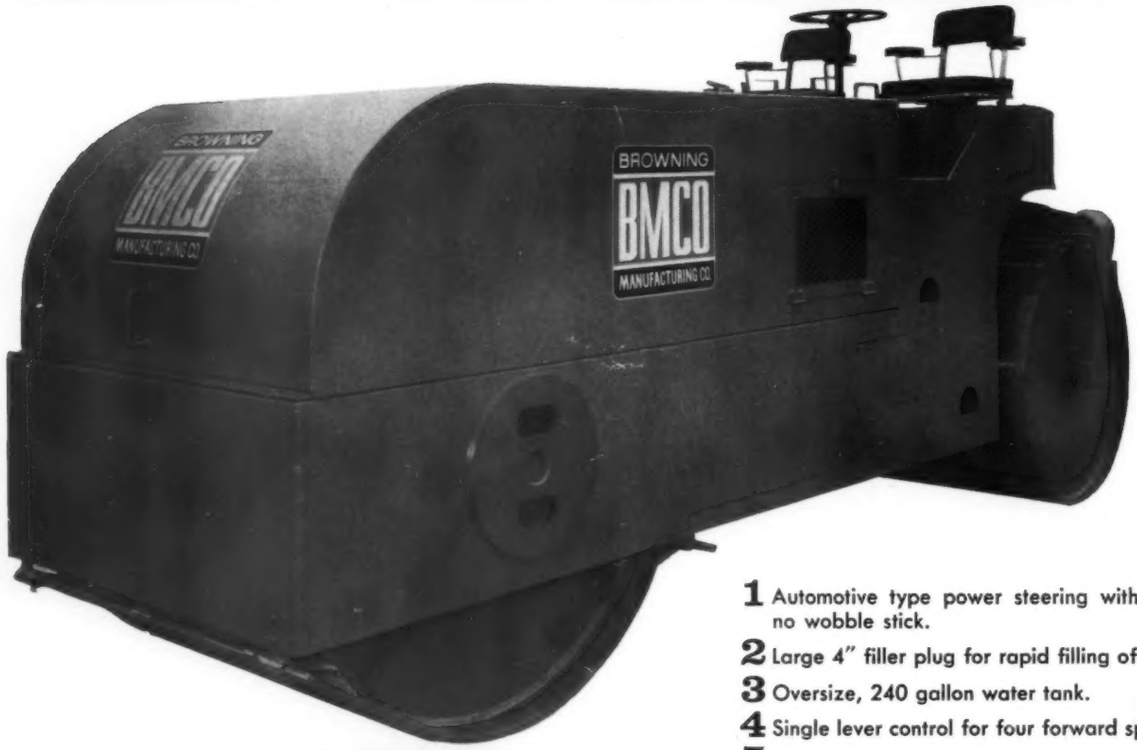
48 How to pump sand out of a dry hole

# ...ONTRACTORS and ENGINEERS

...GAZINE OF MODERN CONSTRUCTION DECEMBER 1960

# BMCO's new 8-12 ton tandem... *deliberately designed with roadbuilding in mind!*



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For more facts, use coupon or Request Card at page 18 and circle No. 251

# CONTRACTORS and ENGINEERS

Contents December 1960


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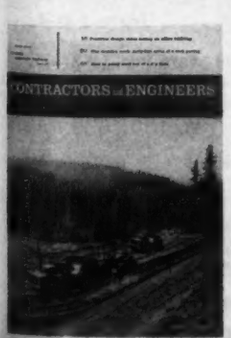


**COVER:**

Two spreads of Euclid scrapers take on a tough 3-million-yard earthmoving job for a new 4-lane highway that will skirt a stand of huge redwoods near Myers Flat, Calif. TS-24 scrapers and a TC-12 push tractor work a sidehill cut. Extensive subdrains were required to stabilize the soil and check slides. Page 26

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# Editorial

# Public Service

We take this opportunity to congratulate John A. Volpe, current president of the Associated General Contrators of America, on his election last month as governor of Massachusetts. The Bay State, ninth in population of the 50, has signally honored the Malden, Mass., building contractor, and we wish him success in his coming 2-year term.

Only a few contractors or engineers ever become interested enough in politics to aspire to public office. We feel that it would be a good thing for the country if more construction men were elected to administrative posts at local, state, or national levels. Successful builders have a capacity for hard work, know how to cut through all kinds of obstacles—including red tape—and marshal their resources of men, material, and machines to produce public or private work that is an economic asset to the country. There is no reason why such talents could not be used to equal advantage in political service to the nation.

Even if they do not wish to participate actively in politics, contractors and engineers can still do much good by pointing out what their communities could and should do about construction. For instance, the Chicago Buildings Department has long shown reluctance to modify its code to permit the use of prestressed concrete within the city. Through perseverance, however, users and producers of the material have finally obtained permission to employ prestressed concrete in Chicago in certain types of construction. This was accomplished after prolonged conferences in which well substantiated reports and analyses favoring the material were submitted to the regulatory department for its information.

Right now in New York City, the administration is cracking down on contractors who may obstruct sidewalks and streets with supplies and equipment while they are engaged in building construction. Fines from $10 to $100 for each day the violation exists, and even imprisonment, may be imposed under a recently passed local bill. Contractors engaged in construction in the narrow canyonlike streets of Manhattan are consequently harried and hampered in delivering materials to the site and putting them in place.

Such harsh measures toward contractors engaged in projects that add to the economic betterment of the community are in sharp contrast to the lenient attitude shown toward the ever-increasing street congestion by manufacturers within New York City. Before a recent gathering of planners, Harold M. Lewis, New York consulting engineer, advocated provisions for off-street loading facilities in the garment and wholesale districts by constructing, in the interior of each block, joint truck berths and access roadways to crosstown streets. "The use of these streets as truck terminals and their sidewalks as loading platforms is not in the public interest," said Lewis.

These are just a couple of isolated instances of how construction people can and do make their voices heard in civic life. More voices are needed in many places. One such instance in New York City would be to urge the speedy construction of two expressways across Manhattan to relieve traffic congestion. A downtown route has already been planned. The federal government would pay 90 per cent of the cost of construction and right-of-way, with the state taking care of the remaining 10 per cent. But the city, which looks after the relocating of those who would be displaced by the project, appears in no hurry to do its share of the work.

A midtown route has been shelved time after time by pressure from various associations which have vested interests in real estate to maintain.

Practically every community has some project in mind that would benefit its residents. These projects, of course, should be both necessary and economically feasible. If they satisfy these two conditions, then it is up to all concerned to work for their approval and acceptance. Construction people are best qualified to speak out in behalf of such work. They will serve the community by so doing.


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# Bonds Voted

Voters across the nation approved over $3 billion in bond issues for state and local construction on election Day. This included a $1,750,000,000 flotation to finance a huge California water-control project that eventually will surpass the Tennessee Valley Authority in construction cost.

Bond issues that appear to have secured voter approval at this writing may result in enough construction spending to give the economy a needed boost in 1961. Here is a rundown of results affecting construction in 20 states.

Alaskans voted a $23 million issue for a ferry system. Additional financing approved for airports, hospitals, and construction at the University of Alaska brought the total to a minimum of $30.5 million. An offering for construction of state buildings in Anchorage and Fairbanks—still in doubt at this writing—would raise the total another $9 million.

California's record-breaking water bond plan will finance a great earth-fill dam near Oroville on the Feather River and a system of levees, canals, aqueducts, and pumping stations that will supply water to dry sections of central and lower California. Voters also approved a $153 million issue for school construction in Los Angeles and, apparently, two sewer-improvement proposals—one in San Diego for $42.5 million and another in San Francisco for $12.5 million. Riverside got approval for a $5.6 million water bond issue and $4.5 million for a high school.

Connecticut reported a $1,850,000 redevelopment fund approved in Hartford.

Florida school issues passed provide $35 million in Duval County and $12 million in Hillsborough County. In Orlando a $4.5 million storm and sanitary-sewer issue passed.

Illinois voted $195 million for six state universities and $150 million for institutions.

Kentucky voted heavily for highway, bridge, and tunnel bonds totaling $90 million, and $10 million in state park funds.

Louisiana's St. Bernard Parish passed a $3 million school issue.

Michigan passed an $800,000 flood-control issue in Flint and $2,275,000 for a new city hall in Ann Arbor.

Missouri reported a $75 million bond program approved by Kansas City voters for a sewage-treatment project and mains.

Nebraska, at this writing, reports approval of a $10.7 million sewage-disposal issue at Omaha.

New Mexico voted $8 million for schools.

New York voters approved a $75 million park issue and a proposal to add $5 million to their annual public-housing subsidy, raising it to $44 million.

In North Carolina, $7,350,000 in bonds for various purposes passed in Greensboro.

Ohio's city of Cleveland got approval from voters for a $10 million public auditorium, $3 million for urban renewal, a $4 million fund for port and lakefront airport development, and $800,000 for a parking project. Voters also approved $17 million for the Cincinnati general hospital, and $6.5 million for urban renewal in Youngstown.

Oregon voted for a $135 million issue to expand a program of home loans to veterans, a $47.5 million issue for college dormitories, and $9.5 million for docks in Portland.

Pennsylvania bonds approved included $22,950,000 in general construction funds, another $18.3 million for water and sewage works, and $6 million for mass transportation facilities—all in Philadelphia.

Rhode Island residents voted $6 million for buildings at the University of Rhode Island, $2.5 million for training-school cottages, and $1,750,000 as the state's 10 per cent share of a hurricane barrier.

Tennessee's Hamilton County secured voter approval for a $7 million school bond issue.

Texas passed a constitutional amendment raising from 3 per cent to 3.5 per cent the maximum interest the state may pay on bonds sold to finance veterans' land purchases. This will reactivate a program in which another $62.5 million in bonds remains to be sold.

Washington's Port of Seattle voted $10 million for harbor improvement. Another $5 million was approved for flood control in King County. In Yakima a $45,000 irrigation project was approved.

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Why settle for a truck mixer that only "partly" matches your operating requirements?

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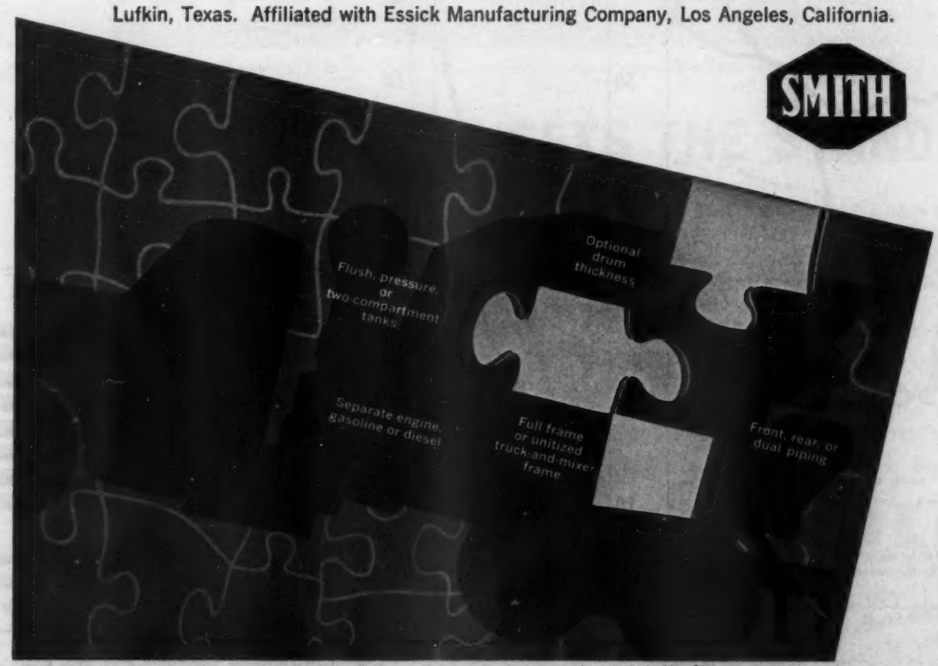
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For more facts, use Request Card at page 18 and circle No. 252

# Surveying Washington

by E. E. Halmos, Jr.

### *Federal construction to rise, but no big jump is expected*

With the national elections over, the bets paid off, and the nation (but not Washington) settling back to normal, you can take a look now at what the effect might be on the construction industry.

The over-all conclusion has to be something like this:

Within a year, there'll be more federal construction work and more encouragement for construction at other levels of government than there has been for the past three or four years.

But a really spectacular jump in federal work, or even in the area of easing credit restrictions, doesn't seem to be in the cards.

In other words, you'll have to salt your hopes of more work and easier working conditions with a liberal helping of facts that emerge from the election, and from facts of life in Washington.

It is now certain that Congress will receive two budgets by the end of January—one, as required by law, prepared by President Eisenhower, the other by Sen. Kennedy, as soon as possible after he takes office.

The federal departments have had to prepare their estimates for spending bills for fiscal 1962 on the assumption that existing conditions (and administration policies) would continue. So the enormous preparation, now nearly concluded, will reflect something close to current-year viewpoints of the outgoing administration. The problem for the new administration is that there isn't much time—and there is much less facility—for preparing its own budget. Thus, the changes made by Kennedy probably won't be too great from a spending standpoint.

The second point to consider is a combination of two facts: the closeness of the popular vote between the two Presidential candidates, and the makeup of Congress.

The closeness of the popular vote makes it clear that Kennedy, right now anyway, has nothing like the tremendous personal popularity that President Eisenhower has had throughout his eight years. Thus he can't easily go over Congress' head—as Eisenhower could—to get his way by putting his prestige on the line with the electorate.

The makeup of Congress thus becomes the key factor, at least for the first two years. Kennedy's election hardly disturbed the existing division in the Senate—it now has 36 Republicans, 64 Democrats. The House has

178 Republicans and 259 Democrats. The election leaves the Southern conservatives firmly in the saddle in their key committee chairmanships and in a position to block any legislation they don't like, with the help of their Republican colleagues.

Of course, every new President gets a kind of "honeymoon" from his first Congress, during which he is allowed his way in a lot of things. Such a honeymoon might last longer for Kennedy than it would have for Nixon, since Kennedy's is the majority party.

But it seems certain at this writing that the Congress will continue to be basically conservative, and so not likely to buy any really radical spending programs.

Another factor that would militate against too sudden changes is that the incoming administration will bring in a lot of new people to head departments and bureaus of particular concern to construction, as well as all others. These men will have to build up some time in their jobs before throwing too much weight against the direction in which the department is launched.

### *New legislation due in number of areas*

Having said all that, though, you can run through some of the legislative matters that are certain to come up in January, and make some assessment of the chances. It might go about like this:

1. Some sort of added federal aid for school construction seems a certainty, as both parties are committed to getting some legislation through.

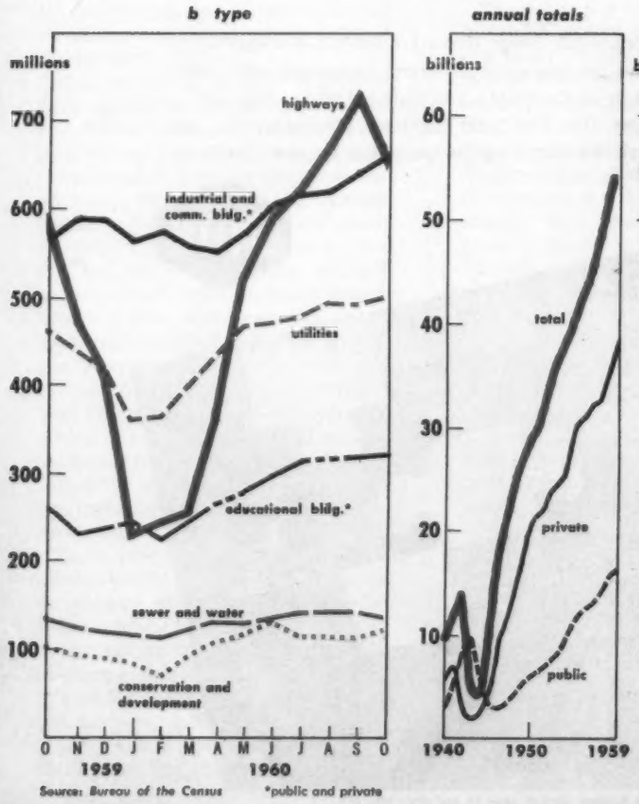
2. Certainly there'll be more new starts approved for both the Bureau of Reclamation and the U. S. Army Corps of Engineers.

3. It seems that there will be a good chance for a "Department of

## Industry Trends

### DOLLAR VALUE OF NEW CONSTRUCTION

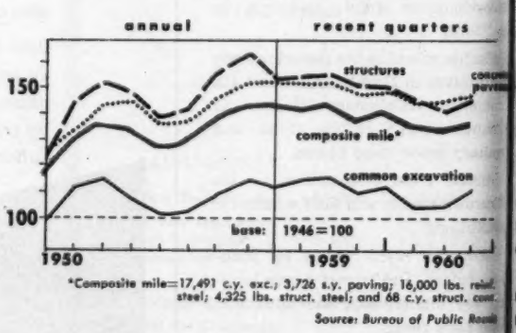
*Recent Monthly Trends*




Source: Bureau of the Census *public and private

### AVERAGE BID PRICES

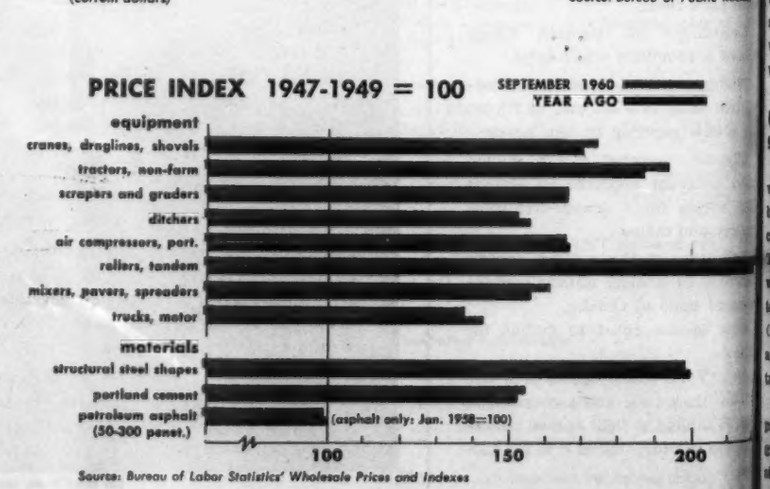
*Federal Aid Highway Construction*




*Composite mile=17,491 c.y. exc.; 3,726 s.y. paving; 16,000 lbs. rebar steel; 4,325 lbs. struct. steel; and 68 c.y. struct. conc.

Source: Bureau of Public Roads

### PRICE INDEX 1947-1949 = 100




Source: Bureau of Labor Statistics' Wholesale Prices and Indexes

Urban Affairs" to represent growing urbans areas at a cabinet level. Such a department would consolidate many construction functions now divided among various departments and would set up a new "chain of command" for contractors in this field.

4. With Kennedy heavily pledged to increase the defense effort, a jump in the military construction aspects of defense appropriations seems obvious.

5. On various proposals to ease credit restrictions, you can't draw such a clear line. Democratic campaigners made much of pledges to ease credit for industry and individuals. But a conservative roadblock could be built.

6. For the same reason, it is not at all certain what will happen to future financing of the highway program—which comes up for what could be a complete rewrite in 1961. Had Kennedy obtained a big enough popular vote to be considered a "mandate," or had he swept enough Democrats into

the Congress, he might be able to put across a proposal to finance the highway program by bond issues or other borrowing. But the leading Democratic advocate of fiscal responsibility is still very much in evidence—Sen. Harry F. Byrd of Virginia—and the demonstration of his power in keeping Virginia out of the Democratic column will not be lost on the new administration.

7. You'd have to put the question of added federal grants for stream-pollution clearance works in the same doubtful column, for the same reason.

8. On labor affairs, a first-glance estimate indicates action on two fronts: raising the minimum-wage floor to about $1.25 per hour; and some concessions by the new administration, at least on such matters as common-situs picketing.

9. Investigations—particularly in the highway field—will probably continue, though perhaps at a little slower pace. The new investigations will probably begin early this month, with Florida in the limelight.

### *U. S. firms overseas want government credit program*

Construction and engineering firms working abroad want the U. S. to back them with credit, so they can compete with foreign contractors. They want (1) a credit program that would enable them to extend long-term credit as do foreign firms; and (2) an insurance program to protect against arbitrary cancellation of contracts.

One interesting point: A credit program such as was suggested would greatly help the sale of U. S. construction equipment abroad.

For more facts, use Request Card at page 18 and circle No. 253

### *Recent NLRB decisions knock down pre-hire pacts*

To clarify your thinking on the recent spate of decisions issued by the National Labor Relations Board—in most cases knocking down hiring-hall and union referral agreements between contractors and unions—you might consider a recent speech by Stuart Rothman, NLRB's general counsel.

Rothman points out that Section 8 (f) of the Taft-Hartley Act amendments of 1959 (the Landrum-Griffin bill) says specifically that it is not an "unfair labor practice" for an employer to enter such a "pre-hire" agreement, if (1) the agreement recognizes the union, even though there has been no election to determine majority status; (2) it requires the employees to join the union within seven days; (3) it requires the contractor to notify the union of opportunities to refer qualified applicants for employment; and (4) it specifies qualification for employment based on experience or seniority with the employer or in the industry, or geographical area.

The agreements that NLRB has been knocking down are pacts, usually, where one or more of these special situations is not covered.

### *Water-pollution conference expected to produce new ideas*

Election results haven't dimmed in any way the high hopes federal officials have for that National Conference on Water Pollution this month.

Construction's stake in the outcome is very large. It has been estimated that 4,000 new sewage-treatment plants should be built and 1,700 others updated, for a total construction cost of around $4.6 billion, just to catch up with needs to the year 1968. It is also estimated that industries could spend about $2 billion more to treat wastes not discharged through municipal plants.

The new No. 12 Series E Motor Grader spreads untreated base and handles cleanup for Massey Sand and Rock Company

# THE NEW NO. 12E SETS THE STANDARDS

Widening U. S. 60-77-99 to a 4-lane limited-access highway, Massey Sand and Rock Company of Indio, California, recently added a new No. 12E Motor Grader to its Cat fleet. The improvements, effective with this new series machine, showed up immediately. As Tom W. Carter, manager of the firm, puts it: "The increased productivity of the new No. 12 was very noticeable. You can depend on new Cat products to give greater operator comfort and better productivity."

One of the big reasons for the new performance standards of the No. 12 is the new compact 115 HP engine. Incorporating the latest developments in metallurgy and design, this modern engine has greater lugging ability for the tough jobs, long life and easier servicing.

Caterpillar engineers did not stop with just a compact diesel. There's a new vertical starting engine to give easier, all-weather starting. The dry-type air cleaner is now standard—it removes 99.8 per cent of air-borne dirt every service hour, cuts maintenance.

Of course, the new No. 12 retains the dependable Caterpillar oil clutch that gives up to 2000 hours without adjustment; mechanical controls that engage easily; and plenty of throat clearance between moldboard and circle for improved rolling action.

See your Caterpillar Dealer. He'll show you—on your job—that the No. 12E lives up to what users are saying about it. He can also show you the 150 HP No. 14, the No. 112F with 100 HP and the No. 112E with 85 HP—they're built to be the best for the job.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

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THE NEW NO. 12 MOTOR GRADER BUILT FOR THE TOUGH JOBS

## Tricks of the Trade

# Pick up traffic cones at high speeds with truck attachment

Those rubber cones that are widely used to guide traffic and delineate obstacles on highways can be picked up at high speeds by a unique rig developed in the Seattle District shops of the Washington Department of Highways. The rig has been operated at speeds up to 40 mph, but the average operating speed is 15 mph. A higher rate of pickup tends to affect efficient operation.

The device, known simply as a cone pickerupper, can be attached at the rear of either side of a specially

equipped pickup truck. It is powered by Vickers hydraulic motors mounted on either side of the truck and supplied by a pump that is belt-driven from the truck engine.

In essence, the device consists of a pair of 50-inch-diameter wheels mounted on a common axle, which is bent at an angle of 15 degrees between the wheels. The spokes of the wheels are ½-inch steel tubing. The rims were fabricated from 1-inch tubing and are lined on the inside edges with rubber hose. The axle is mounted on the truck so that the 15-degree flare is always open forward and the wheel rims almost touch at the rear.

The inside wheel is driven by the hydraulic motor through a V-belt. The outer wheel is connected to the inner wheel by a leather strap between one spoke of each wheel. This strap rotates the outer wheel as the inner one turns.

In operation, the driver of the pickup watches through a special rear-view mirror and aims the pickerupper wheels at the cones as he rolls along. It makes little difference how fast he travels under the maximum speed of 40 mph. The hydraulically driven pickup wheel operates at a nearly constant speed, which can be adjusted through regulating valves. A man in a seat at the back of the pickup removes the cones from the device.

One very useful application of the pickerupper has been on the Lake Washington Bridge in Seattle. The traffic lanes of this 4-lane bridge are

# LUBE LOGIC Five ways to eas

## Now's the time for battery check-ups

With cold weather ahead, your batteries will soon work harder than ever. Here's how you can help make sure they're up to it:

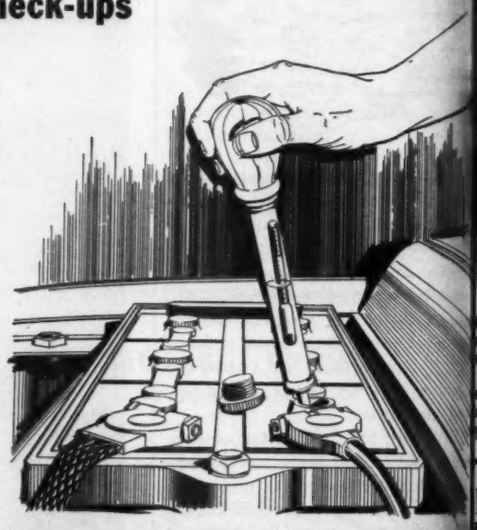
Inspection

- Inspect battery case for cracks and leaks. See that vents in cell caps are open.
- Check battery posts and cable clamps for looseness, breakage or corrosion.
- Using distilled water, bring electrolyte in each cell up to level indicated in cell opening.

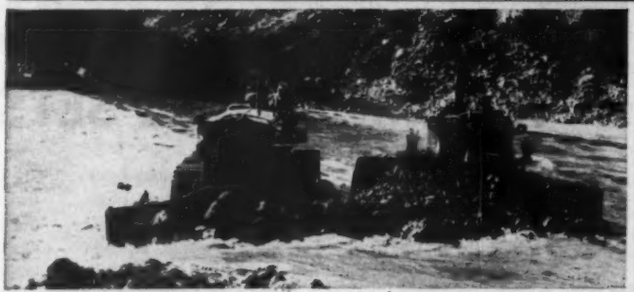
Hydrometer test for specific gravity

- Use a temperature-corrected hydrometer to test the state of battery charge. Make sure battery has not been recently fast-charged, nor water added.
- Draw enough fluid from each cell to raise float off the bottom of the hydrometer tube. Holding hydrometer straight up-and-down, take eye-level reading of the neck of the float. Repeat for each cell.
- Note the temperature, and correct hydrometer reading by subtracting 0.004 from the reading for each 10°F. below 80°F. (Example: If hydrometer reads 1.280, and temperature is 70°F., corrected reading would be 1.280 – 0.004 or 1.276.

*Normal state of charge for 12-volt battery is 1.260 to 1.280 specific gravity. For a 6-volt battery, 1.265 to 1.290 specific gravity.*



## LEADING CONTRACTORS—EVERYWHERE—RELY ON TEXACO LUBRICATION



▲ **Isbell Construction Company** bulldozers remove reefs from river channel on Truckee River Flood Control project near Sparks, Nev. Isbell heartily endorses Texaco's Simplified Lubrication Plan.

◀ **Interstate Highway 80 Project** at Colfax, Iowa. Texaco Engineer E. A. Rolwes (right) works closely with Mott Construction Company on the important assignment of keeping equipment on the job and maintenance costs low.

▲ **Ledbetter-Johnson** gouges out largest rock (306 ft.) east of Rockies in highway project near Dalton, Ga. This company uses Texaco lubrica to keep their equipment on the job . . . their

changed twice daily to give three lanes inbound in the morning and three outbound in the evening. The rubber traffic cones are used to separate the two directions of traffic. They must be put out and picked up, morning and evening.

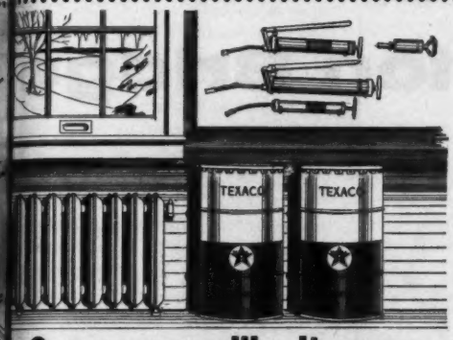
A really successful device for putting out the cones has not yet been perfected, so they are placed by hand by a man riding on the rear of a pickup. The cone pickerupper does a quick job of retrieving them when the rush hour is over.

The second successful use of the machine is in picking up cones placed by highway striping crews to keep traffic off of the fresh paint. These cones are put out by a man riding on the rear of the painting rig. After the paint has had about an hour to dry, the two men with the cone pickerupper follow along and pick up the cones.

The machine not only picks up the cones faster than they can be retrieved by hand, but it is safer. The seat at the rear of the pickup is not too close to the road or to traffic. This is much safer than having a man sitting in a low exposed position and reaching out for the cones.

The pickerupper was designed and built in the Seattle District shops of the Washington Department of Highways. The original design and operational model were made by W. E. Adams, equipment superintendent, Washington Department of Highways, District No. 6, Spokane. The hydraulic application modifications were added by W. D. Kinsinger, equipment superintendent, Seattle.


# tease winter maintenance



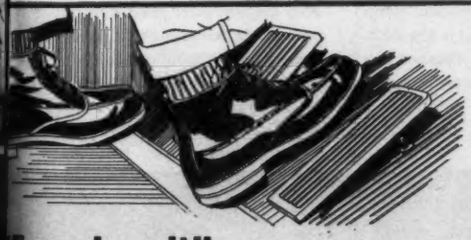

## Grease guns like it warm

re grease guns this way, properly racked to avoid damage, d they'll give you much better service. Incidentally, lubrits like to be stored warm, too.

Warm up the guns if they're too cold to pump the lubrint. Best way is to bring them into a warm place far enough advance of use. Don't ever attempt to warm them up direct application of heat.

## Save the engine— not the anti-freeze

Go slow on using last year's anti-freeze. Although it might still give good protection against freezing, chances are those chemical additives that protect the cooling systems of your engines against rust and corrosion have lost their punch. Your best bet, after draining and thoroughly flushing the radiators, is to fill them up with fresh new anti-freeze — such as Texaco P-T Anti-Freeze.



## Easy does it"... after an oil change

hen an engine's crankcase is drained — so is the oil mp's intake sump and pipe. And when the engine starts , the oil pump must first suck up a lot of air before it starts ewing oil.

To avoid possible damage to the engine, idle it first at w speed. The oil pressure should begin picking up in matter of seconds and reach normal readings within sevral minutes. Wait until it does — before you start working engine.

## All about mobile lube rigs

- How to make good lube rigs
- How to use lube records to make rigs more valuable
- Special purpose lube rigs
- Pros and cons of mobile and centralized lubrication

These are just a few of the facts about mobile lube rigs you'll find discussed in the March 1960 issue of Texaco's *Lubrication* magazine. We've devoted the whole issue to it —and we'll send you a copy *free*. Write today to Texaco Inc., 135 East 42nd Street, New York 17, N. Y., Dept. CO-20.

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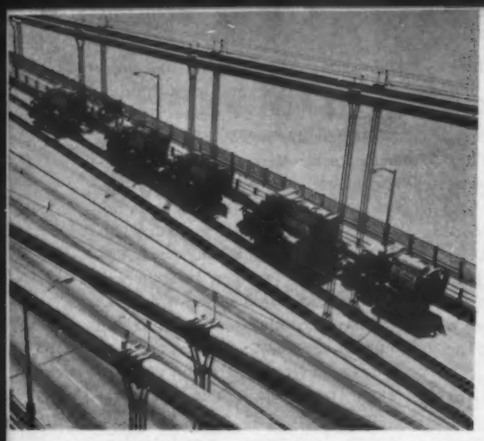
# Inexpensive turnbuckles for dredge line

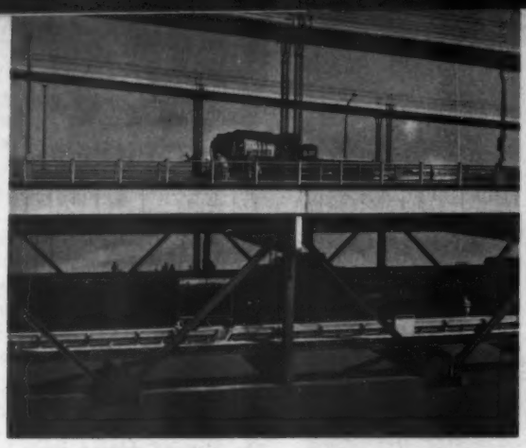
Need an inexpensive, sturdy turnbuckle? The welders on the dredge Paul F. Jahncke can show you how to build one. They keep busy during slack hours by making turnbuckles to hold together lengths of the dredge's discharge line.

The main member of the assembly is a 14-inch length of 1¼-inch pipe. Into each end of the pipe, ⅞-inch nuts are welded so that the nuts are concealed by the pipe. One nut is threaded. The other nut is drilled out so that it contains no threads. The nut without threads holds a 4 × ⅞-inch rivet. The threaded nut receives a 16-inch length of ⅞-inch threaded rod. To the exposed end of the threaded rod is welded a flat bar loop with holes to receive a connection pin. To the exposed end of the rivet, a similar flat bar loop is welded.

Before assembly, the short length of pipe is packed with grease. This assures constant lubrication and prevents the threaded rod from rusting. The turnbuckle is tightened by turning the pipe with a pipe wrench. Jahncke Services, Inc., out of New Orleans, saves money and keeps its welders busy by using this ingenious device.



The 4½ inches of concrete for the second deck of the George Washington Bridge was put down in just under 4 weeks, with crews working 5 hours daily. Rex transit mixers chute the concrete to hoppers on the lower level through holes cut in the sidewalk.



A Gar-Bro 4-yard double-gated hopper on the second deck of the bridge supplies one of the two paving crews. The crews started work on opposite-bound roadways at the center of the span and worked toward opposite shores to equalize the weight of concrete on the bridge.

A Michigan tractor-loader picks up concrete the hopper. Two of these rigs worked with crew. Holes were cut in the sidewalk above at and 400-foot intervals so that hoppers could moved back as work progressed.

# First concrete for second deck of George Washington Bridge

## Fast delivery and handling of lightweight concrete allow crews on 5-hour day to do job in less than a month

by BILL DOWDELL, assistant editor

Four Michigan tractor shovels, making runs of not more than 400 feet, brought concrete from hoppers to paving crews working on the second deck of the George Washington Bridge between New York and New Jersey, and made every minute count during the 5-hour workday.

Rex transit mixers hauled the lightweight (Lelite) concrete some 30 blocks from Colonial Sand & Stone Co.'s plant in Manhattan to the bridge, went through the toll gates, and parked in the outer lanes of the upper deck to chute the mix through holes cut in the sidewalk to hoppers on the lower level. The Michigans kept a steady supply of the mix moving to paving crews, which used a vibrating screed to strike off the concrete.

This method of handling the paving proved very successful for Horn Construction Co., Inc., Merrick, Long Island, N. Y., making it possible for the company to complete initial paving in less than a month. About one week was cut off the time that the work was originally estimated to take.

Working under a subcontract with Bethlehem Steel Co., which erected lower-level steel and installed steel pan-type forms, Horn placed some 5,000 yards of concrete to a 4½-inch depth for the 4,670-foot distance between the bridge anchorages. This will receive a 1½-inch blacktop wearing surface under a separate contract that is still to be awarded.

Job restrictions made transit-mixer, hopper, and tractor-loader handling of the concrete necessary. Approaches for the lower deck are currently under construction on the New York and New Jersey sides, and this made it impossible for transit mixers to gain access to the second level. Since the transit mixers had to use the outside

After dumping concrete over the reinforcing, this Michigan levels the mix out with the lip of the bucket before workmen strike off the mix. Generally, while one tractor-loader was placing concrete, the other was picking up a load.

A Master vibrating screed, with both screeding and vibrating action, is pulled along by the crew to strike off the concrete. Power for the vibration is supplied by a Briggs & Stratton engine. In the background, concrete is curing under wet burlap.

lanes of the upper deck to deliver concrete, paving operations were restricted to the hours between 10 a.m. and 3 p.m. so that the bridge would be free to handle peak morning and afternoon rush-hour traffic.

### Equalize weight on bridge

Horn's two paving crews started work at the center of the bridge; the one in the eastbound lane worked toward the New York shore, the crew in the westbound roadway worked its way toward the New Jersey shore. This equalized the weight of concrete on both sides of the bridge. When half of each roadway was finished, the crews moved back to the center and started paving the opposite halves. This paving added 7,425 tons to the weight of the span.

In order for mixed concrete to be received in the hoppers on the second level, 2-foot square holes were cut into the sidewalk of the upper deck at 300 and 400-foot intervals so that concrete hoppers would never be located too far from paving operations.

Two Michigan tractor shovels worked with each paving spread. As they picked up concrete at a Gar-Bro 4-yard hopper and made their short runs to dump it over the reinforcing, the paving crew used a Master vibrator combining screeding and vibrating action to strike off concrete as fast as it was placed.

Each crew completed an average of about four or five 35 × 60-foot bays daily. During these operations, the maintenance traveler that operates below the second-deck level was at work washing down the concrete drippings. Wet burlap was placed over the concrete to cure the mix.

### Personnel

Construction of the lower deck and the approaches is being done by the Port of New York Authority, which has H. A. Druding on the job as general resident engineer. On the job for Horn Construction Co., Inc., was R. M. Sharkey, superintendent. The general scheme for carrying out the work was developed by H. J. Fellhauer, general superintendent and M. Hornstein, president of Horn, with the assistance of S. C. Hornstein, treasurer.

### Approach work monitored by TV

On the New York side of the span, approaches, exit ramps, and a 2,000-foot section of 200-foot highway is being built to tie into the Cross Bronx Expressway. This work was let in various sections to a number of contractors. One of them, Johnson, Drake & Piper, New York City, is using a closed-circuit TV monitoring system to give its project manager, John Hoel, a view of the work area, the crew, and some 50 pieces of equipment. The TV camera, with a remote-control long-range lens is mounted on the roof of a 5-story building nearby. If any machine is obstructing work, Hoel can spot it immediately and order the rig removed. THE END

Blast-hole drilling required for approach work on the New Jersey side of the bridge is being handled here by a Chicago Pneumatic G-800 Tracdrill. The lower level is scheduled to be opened to traffic in 1962.

Blasted rock is loaded out to a Mack truck by a Cat 977 Traxcavator during work on the New Jersey aproach to the lower deck. This work is being done under a separate contract for the Port of New York Authority.

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■ There are rippers, then there's the *Kelley Ripper*. Where others talk about 72-inch penetration, the Kelley goes down *84 inches*. Where others talk about saving cents per yard or ton, the Kelley saves *dollars*. ■ The difference is the extra strength built into the Kelley Ripper. The massive tool beam is cast high-alloy steel, ruggedly reinforced. The 3½-inch thick, 14-inch wide shank is of special alloy steel, heat-treated for resistance to wear and shock-loads. Tractor power is concentrated on the ripper tooth for maximum material breakage with minimum shank load. Seven-inch cylinders, with 2⅝-inch rams, keep the tooth at the desired depth. ■ Compare ordinary rippers with the Kelley *Extra Heavy Duty* Ripper — for Cat D9, D8 or D7 Tractors.

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# NEW FORD TRUCKS

## FOR 1961

**619 new models!** All engineered with one idea in mind . . . economy! New "Big Six" engine for 2-tonners plus five Cummins diesels for the new H-Series tractors expand the proven line of Ford engines to 18—with one just right for your job. A wider-than-ever choice of transmissions and axles lets you select the proper gearing to get the required performance at the most economical engine speeds.

And . . . on all 1961 Ford Trucks, each part, except tires and tubes, is now warranted by your dealer against defects in material and workmanship for 12 months or 12,000 miles, whichever occurs first. The warranty does not apply, of course, to normal maintenance service or to the replacement in normal maintenance of parts such as filters, spark plugs and ignition points. See your Ford Dealer.

### New! 100,000-Mile or 24-Month Warranty on FORD TRUCK SUPER DUTY GAS ENGINES

New 100,000-mile warranty on Ford Super Duty V-8 gas engines is most liberal in the industry. On 401-, 477- and 534-cubic-inch V-8's, Ford Dealers will replace any major engine part (including block, heads, crankshaft, bearings, valves, pistons, rings) found to be defective in materials and workmanship in normal on-highway use. Warranty covers full cost of replacement parts for 100,000 miles or 24 months, whichever occurs first . . . full labor costs for first year or 50,000 miles, sliding percentage scale thereafter.

### NEW! FALCON PICKUP

Ford's Falcon Ranchero is priced* as much as $231 less than leading conventional half-tonners—but initial cost is just the beginning of your savings! Certified tests by independent experts show gas mileage with the 85-hp Six as high as 30.5 mpg. You only change oil every 4,000 miles, and aluminized mufflers last up to three times as long. New, high-performance 101-hp Six is optional.

### NEW! F-100 STYLESIDE PICKUPS

Ford's Styleside Pickups offer greater loadspace for '61—as much as 16% more! New one-piece cab-body design on longer wheelbases gives new comfort, greater durability. They're big in savings—as proved in certified studies of gas mileage and tire life. They're big in every way except in price—in fact, they're priced* from $31 to $157 below all other comparable pickups!

### NEW! ECONOLINE PICKUP

Modern cab-forward design pares away over a thousand pounds of dead weight, yet you can carry over ¾-ton payloads! It's three feet shorter over-all, yet there's a full 7-ft. box with 73 cubic feet of loadspace! You get live performance and proven gas economy with the popular Falcon Six. And, the best news, Ford's Econoline Pickup is America's lowest-priced* pickup—bar none!

**NOW! CHOOSE FROM 7 NEW SERIES . . . GVW'S UP TO 51,000 LB. — GCW'S UP TO 76,800 LB.**

FALCON ECONOLINE PARCEL F-SERIES C-SERIES

## NEW! "BIG SIX" ENGINE

More power for America's savingest 2-tonners . . . a big 262-cu. in. Six with the performance of big displacement, the durability of heavy-duty construction, plus the gas economy of 6-cylinder design! Available early 1961. You also get improved riding comfort with new smoother-acting springs and a sturdy front suspension that can give up to twice the front tire life of some other makes.

## NEW! SUPER DUTY EXTRA HEAVIES

Ford's Extra Heavies are built for unprecedented durability! Double-channel frames for truck models and single-channel frames of high-tensile steel for tractor models have been designed to provide proper strength with minimum weight. Huskier axles, wider power train choice, short 28-inch front axle setting plus new high-durability cabs and sheet metal are typical of the advancements that give you greater earning power.

Ford's Tandem Axle trucks for '61 are engineered to give you greater flexibility and significant payload advancements. Your choice of 22,000-lb., 28,000-lb., 30,000-lb., 34,000-lb., or 38,000-lb. axle capacity. New, longer wheelbases are available to permit installation of special bodies up to 21 feet long. Aluminum walking beams, wheels and gas tanks are optional to keep chassis weights low and payloads high.

## NEW! 4-WHEEL DRIVE PICKUPS

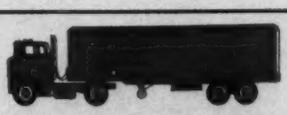
d offers the lowest-priced* 4 x 4 with big 8-ft. box. And se models have the getup and traction to go most ywhere . . . road or no road! They plow through mud, d, gravel or deep snow and easily climb steep grades. u can choose from two modern engines—the gas-ing 135-hp Six, or the 160-hp V-8 that gives extra wer and smoothness with "six-like" economy.

## NEW! SPACE-SAVING TILTS

Ford's popular Tilt Cab Series outsells all other makes and for good reason! Compact 82-inch BBC permits longer bodies for a given over-all length, and wide-track front axle makes it more maneuverable for congested area work. Ford offers the lowest-priced* tilt-cab model in the industry! Simplified tilting mechanism exposes entire engine for money-saving ease of servicing.

*Based on a comparison of latest available manufacturers' suggested retail delivered prices*

T-SERIES



H-SERIES

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# Side lines strengthen distributor's operation

**Contractors and Engineers staff article**

Some distributors concentrate on only a few lines. Some handle a great many. But few spread out their activities to cover as many types of business as Arrow Contractors Equipment Co., Chicago, headed by Charles C. Riordan.

In addition to the customary business in sales, service, and parts, the 29-year-old company has a profitable side line in used equipment and rentals. It manufactures a winch for small tractors. It acts as a storage agent for equipment manufacturers. It also does a sizable business in selling small hardware items to contractors.

The diversification makes for a well balanced business. If sales are down during a certain month, it's likely that rentals will be up. If neither of these departments is doing well, the others will take up the slack.

Bernard O'Rourke (standing), vice president of Arrow Contractors Equipment Co., Chicago, and Charles C. Riordan, president, hash over some of the day's business in Riordan's office. The dealer, in addition to handling equipment, parts, and service does a brisk equipment-rental business and also makes a small tractor winch.

It might seem that all these business activities would be difficult to run efficiently. On the contrary, the work of one department often supplements the work of another. For example, the small manufacturing firm (going under the name of the Charles C. Riordan Co.) puts shop personnel to work when they are not busy overhauling engines. Making some 300 Tractowinches a year yields a tidy profit to the company and prevents seasonal layoffs of skilled mechanics. The manufacturing concern also can turn out a special part for a contractor when none is available.

Rental equipment is a profitable part of the business. It often provides a good outlet for rebuilt used cranes and other trade-in equipment. The company rents a wide variety of items, such as cranes, air compressors, hoists, horizontal shoring (adjustable bar joists to support deck forms), finishing machines, and space heaters.

According to Mr. Riordan, "We find we make a greater margin of profit by renting equipment than by selling it. In four years we can get our money back on a crane."

In new-equipment sales, Arrow handles a wide variety of lines. The exclusive accounts include Baldwin-Lima-Hamilton Corp.; Unit Crane & Shovel Corp.; Ingersoll-Rand Co.; the Ford Motor Co., Tractor Division; Minneapolis-Moline Co.; Whiteman Mfg. Co.; and Universal Mfg. Corp. The company does not carry a major tractor or scraper line.

As the indirect result of a European sightseeing tour, Charlie Riordan has added a couple of foreign manufacturers to his equipment line.

For the last couple of years, his company has been selling and renting American Pecco tower cranes and horizontal shoring. The equipment is manufactured in Peine, Germany, and shipped via the St. Lawrence Seaway to Chicago.

Another foreign line handled by Arrow is a small hydraulic crane manufactured in Sweden. The Hiab 170 crane is mounted on a flat-bed truck, and is operated by one man.

Like many other distributors, Riordan makes a constant effort to re-

MILE-HIGH CALIFORNIA ROAD JOB

NEW TRACTORS C
REALLY R

Packs it in—two D8H Tractors, pulling and pushing, fill a 491 Sc with hard-to-load breccia, a cemented gravel, in 45 seconds.

duce the cost of doing business.

For instance, he has found that it's easy to lose money by offering too high a price for a trade-in. Now his company has a procedure that insures a fair price on a trade-in. Riordan has an experienced mechanic make a careful inspection of the equipment. As the mechanic goes over the crane, he fills out a special check list. He also takes a couple of photographs of the rig. From the photos, the check list, and the advice of the mechanic, top men at the home office decide on a fair price.

Sixty-one-year-old Charlie Riordan was one of the original founders of the company back in 1931.

Today it has 52 employees, operates from two locations, and does about $3 million worth of business a year. The main building is at 47th Street and Kedzie Avenue. Built in 1953, the one-story building has 19,000 square feet of floor space.

The Calumet branch, completed in the spring of 1959, is located at 11901 South Ave. O at the southeastern limits of Chicago. The all-steel office and shop building is served by a siding from the Pennsylvania Railroad. The facilities are also conveniently close to the Indiana Toll Road and the Lake Calumet Canal (a part of the St. Lawrence Seaway).

The 10,000-square-foot building

Almost 4 acres of equipment storage space is available at the Calumet branch. To the left of the Lima truck crane is a 10,000-square-foot all-steel building where the firm's Tractowinches are produced.

serves as a shop and houses the equipment for manufacturing the Tractowinches. It is also used as a storage area for new equipment. The branch manager, George Brown, has his offices at the front of the building. Outside on the 4-acre site, there is ample room for storage.

Bernard O'Rourke is vice president and sales manager; Rex Cunningham, secretary; and R. Riordan, treasurer. THE END


# RSCRAPER TEAMS
# LY PRODUCE

## "A GOOD COMBINATION FOR THE ROUGHEST WORK"

boulders, volcanic ash and mud—mix well with posed shale—then add mile-high working alti-, side-hill operation and unfavorable weather . . . are some of the problems facing A. Tiechert and Inc. as they push a new highway through the Sierra da Mountains in Eastern California. The job, 7.8 of freeway construction on State Highway 40, lves moving two million yards of earth in two five-th seasons. In spite of the obstacles, the Sacra-to contractor holds the work to schedule, expects omplete the job on time this October.

Four D8 Series H Tractor-491 Scraper teams, push-ed by D8s of the same series, set the pace for this ult job. Because of the steep hill haul roads, they the cuts and fills, then handle earthmoving on up to 700 feet. DW21 wheel units take over on longer hauls that range up to 7000 feet.

"The 491 Scrapers with D8s front and rear per-ed very well—especially in wet, rocky ground," W. W. Staring, Project Manager. And he adds, erators and foremen especially like the 491 in because of higher apron clearance, excellent nd clearance and the good distance from axle to . In most cases we used D8-491 teams instead avels on shot breccia. It's a good combination the roughest work."

On rugged big volume, short haul operations like Caterpillar track-type Tractor-Scraper combina-s are the most efficient way to move earth. The new Series H, for example, is over two tons heftier than previous model, packs 23% more horsepower (235 wheel HP), and with direct drive has a speed of MPH forward. Team it with the 491 Scraper

The finished product—traffic moves with speed and safety over a newly completed section of California State Highway 40.

(34 cu. yd. heaped, 27 cu. yd. struck) or the 463 Scraper (28 cu. yd. heaped, 22 cu. yd. struck) for big capacity loads.

Get all the facts—plus a profit-proving demonstration—on the new Caterpillar D8H Tractor and the 491 Scraper from your Caterpillar Dealer. He's ready right now!

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## GM Diesel distributor

The Detroit Diesel Engine Division of General Motors, Detroit, Mich., has appointed Johnson & Towers Baltimore, Inc., 2214 Severn St. Baltimore, Md., distributor for the division's line of industrial, construction, truck, marine, and other power applications.

The firm will cover the state of Maryland, the District of Columbia, and several counties in West Virginia and Delaware.

The new company is currently being represented by the following Maryland dealers: Belden Marine Engine Repair, Ocean City; Madewell Shops, Cambridge; and John Trumpy & Sons, Annapolis.

Spokane Diesel, Inc., 704 E. Pacific, Spokane, Wash., will handle sales and service for Detroit Diesel products in eastern Washington and ten counties in Idaho.

## Koehring divisions name

Western Machinery Co., Inc., P. O. Box 5003, Abilene, Texas, has been appointed by both the Koehring and Parsons divisions of Koehring Co., Milwaukee, Wis., to distribute their products in the Texas Panhandle.

The new distributor, which maintains a branch at Odessa, will handle the Parsons line of Trenchliners, and the complete Koehring line of excavators, cranes, paving and finishing equipment, and hauling units.

## White Motor acquires

■ White Motor Co., Exton, Pa., has acquired Oliver Corp.'s wheel tractor plant at Charles City, Iowa, and its Shelbyville, Ill., plant.

Oliver crawler-tractor products will continue to be sold and serviced through the same Oliver dealer and distributor organization, separate from White's truck sales operations.

Donald V. Buttenheim, president of CIMA, and president of the Buttenheim Publishing Corp., New York City, signs a contract in the office of Mayor Daley of Chicago for 537,000 square feet of space in Chicago's International Amphitheatre for the 1963 Construction Equipment Exposition and Road Show. Seated, left to right, are M. E. Thayer, manager, International Amphitheatre, Mayor Daley, and Buttenheim. Standing, left to right: Boyd S. Oberlink, senior vice president, Allis-Chalmers Mfg. Co., Milwaukee, and chairman, CIMA Road Show Committee; Nello L. Teer, Jr., president, Nello L. Teer Co., Durham, N. C., and president, ARBA; Julien R. Steelman, president, Koehring Co., Milwaukee, and chairman, IRF; M. Clare Miller, president, San Ore Construction Co., McPherson, Kans., and senior vice president, AGC; R. F. Newlin, president, Newlin Machinery Corp., Kansas City, Kans., and senior vice president, AED; Harry J. Kipke, chairman of the board, Coca-Cola Bottling Co. of Chicago, and president, Chicago Convention Bureau; and R. P. McKenrick, executive director, CIMA.


NOW...
your crane can drill holes, too!

CALWELD DRILL
crane attachment

Mounts on any crawler or truck crane in 30 minutes.

Digs holes 1′ to 10′ diameter and as deep as 200′.

Drills up to 60′ per hour.

Now, you can get all the Calweld big bore, fast drilling features and still use your crawler or truck-mounted crane for normal duty when needed. Because the new Calweld crane attachment is a completely self-contained unit, it can be mounted in 30 minutes on any standard ¾ ton crawler or 1 yd. truck mounted crane, ready to dig clean holes fast and straight without manual digging or extra finishing. Now available in three sizes . . . Model 150 B, 150 C, and 150 CH.

All models contain their own power units, and operate independently of the crane power to dig holes from 12″ to 120″ in diameter. Hydraulic controls are mounted in the crane cab for easy, one-man operation. The average crane man can operate a Calweld without previous training or experience.

Hydraulic drill positioner and boom stop combination also provide for slant hole drilling to a 1 to 3 batter with positive accuracy. Hydraulically-operated kelly drive yoke acts as kelly crowd and adds to the crane's capacity for pulling casings.

Telescoping and triplescoping kelly bar permit drilling to 150′ deep without extra drill stems. Drill buckets and attachments of various types are available for fast drilling under any conditions.

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Calweld, Inc. 7222 E. Slauson Avenue
Los Angeles 22, California
For more facts, use Request Card at page 18 and circle No. 257


## Preliminary plans completed for CIMA's '63 exposition

■ Preliminary arrangements have been completed for a 1963 Construction Equipment Exposition and Road Show to be produced and managed by the Construction Industry Manufacturers Association at the International Amphitheatre in Chicago.

The cosponsoring organizations are: The American Road Builders' Association, The Associated General Contractors of America, The International Road Federation, and The Associated Equipment Distributors.

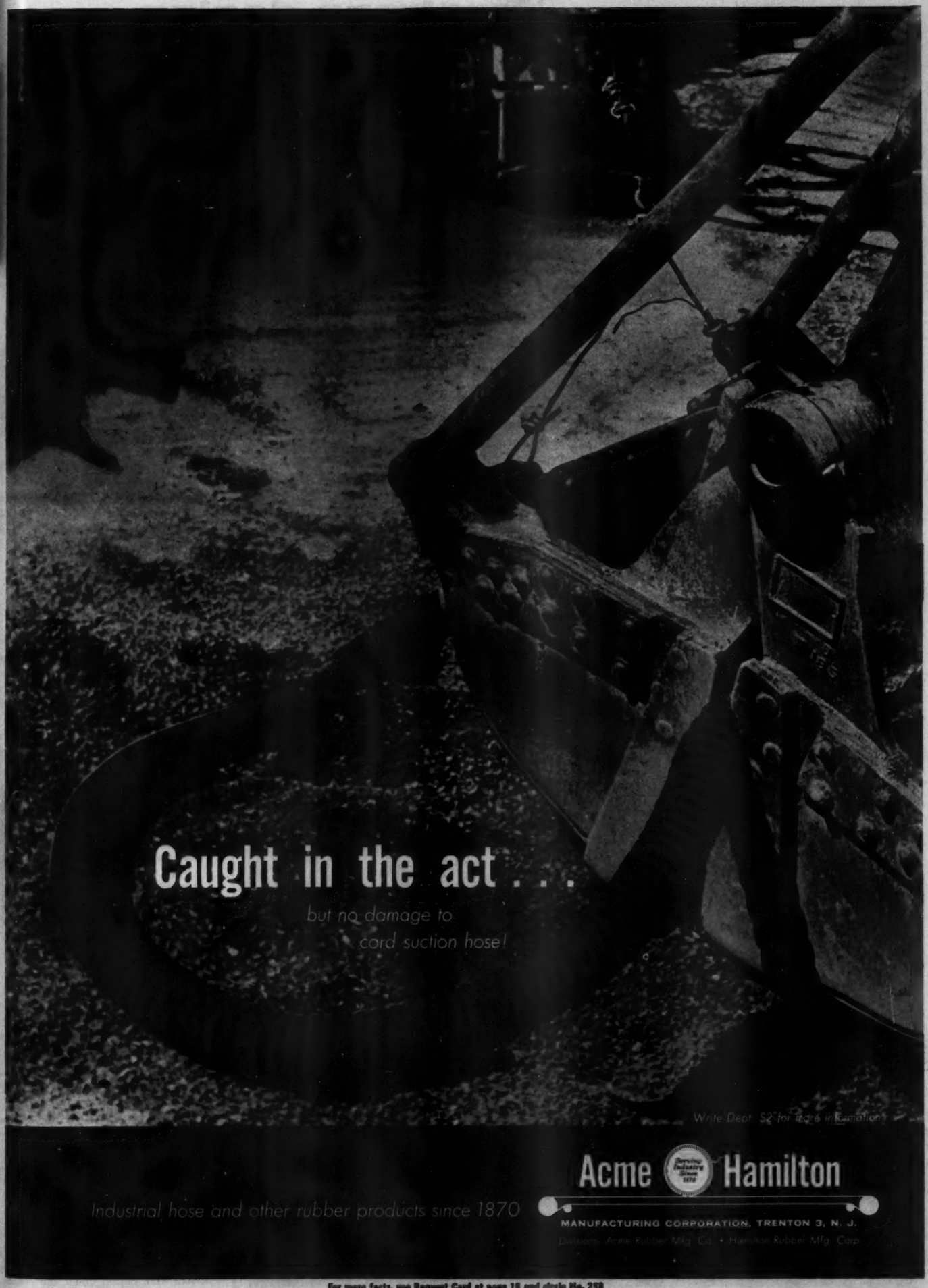
## Clark H. Batchelder joins C&E staff

CONTRACTORS AND ENGINEERS is pleased to announce the appointment of Clark H. Batchelder to its staff as field editor. He comes to this magazine with varied experience in the construction field as superintendent and project manager.

Batchelder studied engineering at Columbia University. He worked for the New York State Department of

Public Works and for Madigan-Hyland, consulting engineers, Long Island City, N. Y., before going over to the contracting side of construction. Prior to World War II he was engaged in military construction in the Caribbean area. During the war he served with the U. S. Navy, Civil Engineer Corps, in both Europe and the South Pacific, attaining the rank of lieutenant commander.

Since then he has been directing highway and heavy-construction projects for such contractors as Walsh Construction Co., Elmhurst Contracting Co., and Horn Construction Co. in various parts of the country.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For more facts, use Request Card at page 18 and circle No. 238

# Prestress design saves money on office building

Columns, exterior beams, elevator shaft, and stair wells for the Queen Street Building in Honolulu are cast in place; the remainder of beams and girders are precast. Prestressed I-beam sections are integrated with the floor slab to form tee-beam sections. The original design called for a structural-steel frame and concrete floor slabs. The Lorain is lifting shoring to an upper floor.

**Contractors and Engineers staff article**

Originally designed for structural-steel framing, the Queen Street Building at Queen and Richards Streets in downtown Honolulu was redesigned and built of prestressed and conventional concrete after the contractor offered to save the owner $100,000 by the switch. The total cost of the structure as built was just under $1.1 million.

The Hawaiian Dredging & Construction Co., Ltd., was the low bidder on the construction of the 7-story office building. The design called for a structural-steel frame with concrete floor slabs. Thinking it could save the owner some money, HD&C checked possible economies of switching to cast-in-place concrete columns and precast, prestressed beams and girders. The cost of the redesigned structure was low enough so that HD&C offered to build it for $100,000 less than its original bid.

### Prestressed sections

The efficiency of the design lies in the use of precast, prestressed I-beam sections that are mass-produced by the two large precasting plants in Hawaii—Concrete Engineering Co. and Prestressed Concrete, Inc. In application, these I-beams are integrated with the floor slab to form tee-beam sections.

Beams used in this structure have a depth of 14 inches and a lower flange 9 inches wide, with a web thickness of 3 inches. Spans are about 31 feet.

Undulating bars projecting out of the top flange tie the precast beams into the cast-in-place floor slab to provide tee-beam action. Negative steel in the slab over the supports gives the structure continuity.

The contractor formed the columns, marginal beams around the outside, stair wells, and elevator shaft with conventional wood forming and shoring and cast the concrete from buckets handled by a Lorain motor crane. When this concrete had been placed for a floor, the prestressed beams and girders were delivered by truck-trailer and set directly in place by the crane. The heavier girders span between the columns, while the lighter beams span between the girders, or between the girders and the marginal beams, to complete the framing.

The forming for the floor was then set in place, resting on the lower flanges of the I-beam joists. A few shores were placed under the beams and girders to maintain them at their proper camber during the concrete


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New Machine Backfills Ditches At Highest Speed...Lowest Cost

You have to see it to believe it! Here, at last, is a low cost, high-speed backfiller that every contractor will want! The rugged new Vermeer "POW-R DITCH-FILLER" is a tremendous labor and time saver. Now, in just one pass, the big 24" power driven 7½' auger deposits all dirt back in the ditch . . . at a speed you never thought possible! The DITCH-FILLER is a highly maneuverable 4-wheel drive unit with a 36 hp Wisconsin engine and power steering. Hydraulic power provides forward travel speed during backfilling. When in transport the unit is powered with mechanical drive. The new DITCH-FILLER will not only cut your backfill equipment costs, but will also greatly reduce your backfill and cleanup time.

Photo above shows the POW-R DITCH-FILLER starting its run. Ditch shown is approx. 12" wide and 4' deep. Machine is jointed at the center for easy steering, better control and greater ground grip from all 4 wheels.

Here's the completed job. Dirt has been neatly and quickly deposited into the ditch in one pass. Area adjacent is clear of all debris and dirt.

MAIL THE COUPON

VERMEER MFG. CO. 1437 W. WASHINGTON, PELLA, IOWA

Please send me complete information, literature and low price of your POW-R DITCH-FILLER. I am interested in seeing a demonstration of the new machine.

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The long precast, prestressed members stand out on the upper level of the building. These were set in place by the crane. A truck-trailer made the delivery from precasting plant to the site. Forming still stands for columns and marginal beams.

placement. These prestressed members are quite limber until the casting is done and they become an integral part of the tee-beam floor.

The contractor bucketed the concrete to each floor by means of the crane and distributed it to the floor forms in buggies.

The new Queen Street Building is located directly across the street from a recently completed multilevel parking ramp that was also built with many similar prestressed members.

**Personnel**

Superintendent for Hawaiian Dredging & Construction Co., Ltd., on the project was Charles W. Watson. Alfred A. Yee supervised the redesign and kept watch of the field operations during construction.

THE END

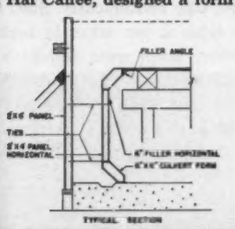

# 492 Ft. Culvert

## Symons Prefab Forms and Engineering Service

### ...Reduced by About ½ Material Needed for Job

How to extend an existing culvert 492 feet to allow Mercer Slough to pass under the new Seattle by-pass of U.S. Highway 99. Also, how to finish it before rains swell the slough, or creek, to over-flowing. That was the problem faced by A. R. Anderson Construction Company, Seattle.

Anderson used Symons Culvert Forms with Symons Steel-Ply Panels. Symons engineering and their Seattle man, Hal Caffee, designed a form lay-




out, so that inside wall and fillet forms could be stripped out without disturbing the shoring for the slab roof. This not only saved time but reduced by almost one-half, the material needed for the job.

The pay-off! It is estimated that it took under 200 man hours to set up and pour the job and under 60 man hours to strip the forms.

For the complete story on the *Seattle Culvert Job*, send in request on your company letterhead. Symons Steel-Ply Forms rented with purchase option.

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MORE SAVINGS FROM SYMONS

For more facts, circle No. 260


## U. S. Steel movie on curtain walls

■ "Curtain Time," a 20-minute color animated film giving technical details of the design, fabrication, and erection of steel curtain walls in all types of buildings, has been released by the U. S. Steel Corp., Pittsburgh, Pa.

Done in a humorous vein, the movie tells the story of an architect who has to design an office building suited to the widely varying ideas of several executives. He solves his problem by designing the building in steel.

The film may be obtained for showings without cost. Inquiries should be addressed to the Market Development Division, U. S. Steel, Room 2831, 525 William Penn Place, Pittsburgh 30, Pa.

## Picture dictionary of building terms

■ "Building and Construction Terms" is a picture dictionary designed to give those engaged in building construction or maintenance a ready reference to the technical language that is used in the trade.

The 57-page book is divided into two sections. The first includes conventional building and construction terms, along with the grouping to which they belong. In the second section are 21 illustrative diagrams for various groupings, on which specific terms are indicated. In all, 30 categories of terms are covered.

The book may be obtained from Arco Publishing Co., Inc., 480 Lexington Ave., New York 17, N. Y. It is available in paper and cloth editions at $3 and $5, respectively.

## Armco Steel news

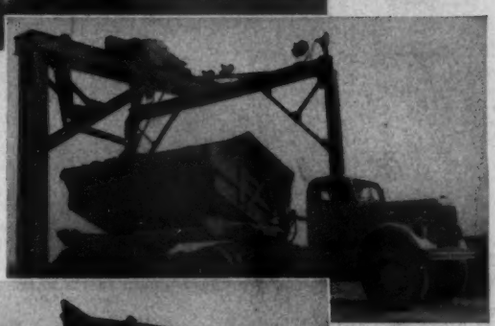
■ Armco Steel Corp.'s research center in Middletown, Ohio, recently completed its 50th year of operation.

Since the center was established in October, 1910, the company's program has undergone rapid expansion. Work is currently under way on a new addition that will double the size of the present facilities.

Research plans include the development of special-purpose superstrength steels for new applications required by advances in technology.

**SIDE DUMPS** for ROCK, EARTH, ORE

**PAN TYPE** truck bodies and trailers 14 to 45 TONS dumped by EASTON electric overhead hoist



**DROP DOOR** truck bodies and trailers 14 to 40 TONS dumped by integral hydraulic body hoists

SIDE DUMP **TRAINS** pan type and drop door capacities unlimited

Variable Wheel Base **REAR DUMPS** capacities 22 and 35 TONS

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For more facts, use Request Card at page 18 and circle No. 261

## One month's work:

# Sixty-two acres of 6-inch paving

***Automatic road builder for finishing subbase and special jointing rig are used on fast job***

by RALPH MONSON, field editor

Two Koehring 34-E Twinbatch pavers supplied the concrete and set the pace for the paving spread. With a 6-inch slab, this was rapid; each batch dumped from a paver completed 3 feet of 25-foot lane. A Blaw-Knox spreader with pan and edge vibrators, a Lewis float-finisher, a shop-designed jointing machine, and hand finishing complete the paving.

With a new Gurries Automatic Road Builder finishing the subbase, a concrete-paving spread placed some 62 acres of 6-inch concrete in just one month to build two big aprons for the Marine Corps Air Facility at Santa Ana, Calif.

The thin slab was a real novelty for the contractor, Gordon H. Ball, Inc., Danville, Calif., which has been doing airport paving in thicknesses ranging up to 20 inches, as well as a lot of 8 and 9-inch highway paving. While the thin slab for this job presented a few problems, it also called for a fast-moving operation.

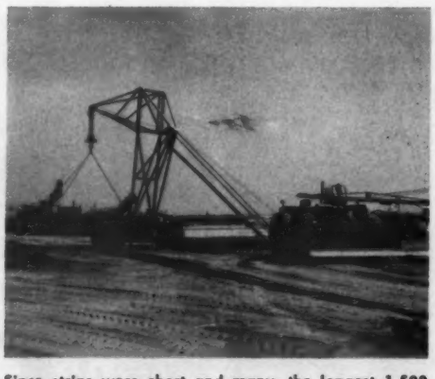
Built under a Bureau of Yards and Docks contract administered by the District Public Works Office of the 11th Naval District at San Diego, the job had Capt. J. A. McHenry, CEC, USN, as officer in charge of construction. He was represented on the job by the resident officer in charge of construction, Lt. Charles Geoly, CEC, USN. Gordon H. Ball's supervisory staff was headed by general superintendent Mike Saporetti. The paving superintendent was F. E. "Bill" Appel; project engineer, Dave Smith; concrete foreman, Bill Southworth; and master mechanic, Floyd Davis.

Included in the project were two big paved aprons, one 1,000 feet square and the other 1,000 × 1,500 feet, which augment the existing facilities for the parking of helicopters. Helicopter mooring eyes are built into the slab in the parking areas. The $1,211,000 contract also provided for the construction of taxiways, roads, lighting, drainage, and other miscellaneous work.

Ball's paving and grading spreads worked as completely separate operations. The grading spread did the preliminary grading and compacted the 12-inch native subgrade material to 92 per cent density. It then laid 12 inches of granular subbase. This was a 30-CBR select material placed in two 6-inch lifts and compacted to 95 per cent density. By the time this phase was completed, the paving spread had moved in.

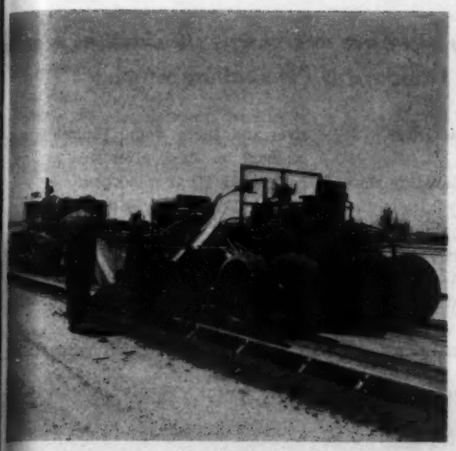
Because of the relatively short strips of paving and the critical curing period for the thin slab, the contractor had to start a large number of lanes in order to keep working continuously. Steel forms were set on both sides of ten lanes to begin the operation. Thereafter, lanes were added to both sides of the sections previously paved until the entire apron was completed. Each of these additional lanes required only a single set of forms on the outer side; the final closing strips required none.

A Pettibone Mulliken Speed Swing, using a special tool, swings forms toward the outer edge of the next lane to be placed. It also uses a special tool to pick up forms and lay them out for cleaning and resetting, and a jig to pull pins. Forms never had to be loaded or hauled; this rig did all work.



Since strips were short and many—the longest 1,500 feet, half or more of them 1,000 feet—the Tournacrane and Tournadozer that moved the train from one lane to another were busier than usual, making at least one move every day, two or more on some days. At this point, the B-K spreader is being transferred.

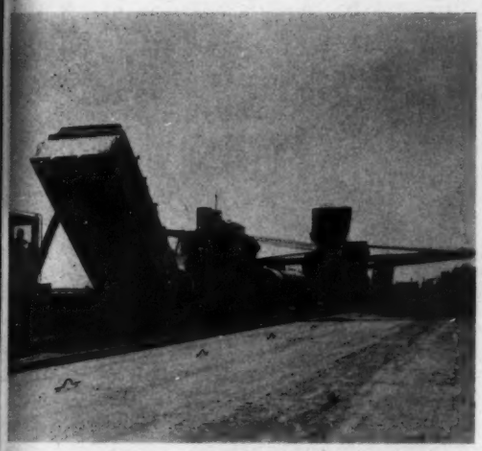
A relatively new machine, the Gurries Automatic Road Builder, finishes the subbase ahead of the paving spread. This long-wheelbase rig, which bears a faint resemblance to a land planer, is a precise, hydraulically controlled grading machine that finishes the surface to an accuracy of 1/25 inch in 15 feet. A D8 moves the rig at 2 to 6 mph.



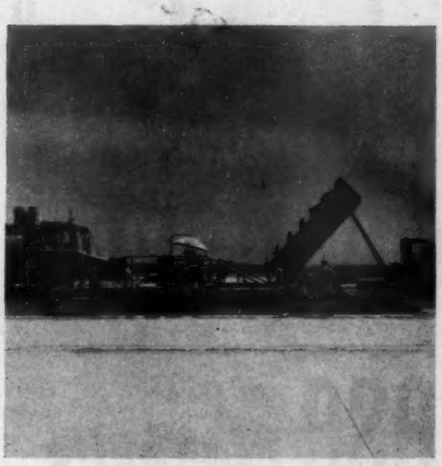
The operator gets off the Gurries rig to check details without stopping the machine. The automatic control system is guided from forms or the completed slab. It also makes grade from a grade wire at one side of the road. A screw conveyor removes excess. A 10-yard-capacity bowl carries enough excess to fill low spots. Conveyor and hydraulic control mechanisms are powered by a Cat D330A engine.

This Tampo 9-wheel self-propelled roller stops work to be serviced by maintenance crews with the Lincoln-equipped lube truck. This roller used to compact the grade worked with the finishing machine, which made one or two passes in each half of the lane to put the grade in perfect shape for the paving train that followed.

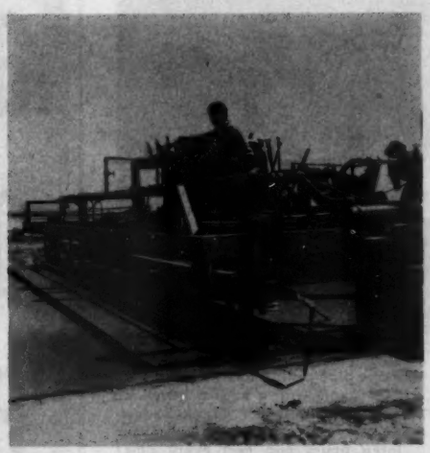
In a few cases, where there was excess material that had to be removed from between the forms and hauled away, Ball hired two Hancock self-loading scrapers pulled by John Deere tractors to do the work. These small rigs worked entirely without help as they handled the loading, dumping, and spreading of the excess material as desired.



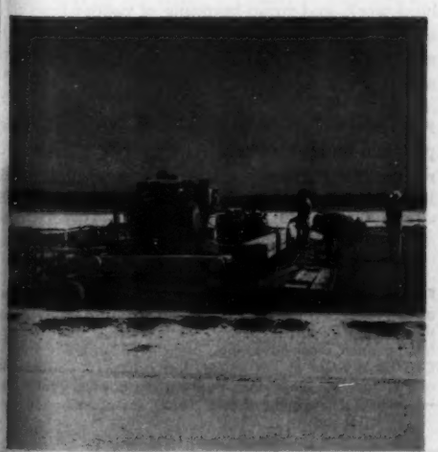
The paving train moves swiftly down the line. A Batch King truck, which is equipped with air-operated gates, is dumping to the lead Koehring 34-E. Both pavers take their water from the big trailer tank towed by the lead paver. The Blaw-Knox spreader strikes off the concrete for the 6-inch slab. Note the tie-down inserts, which were placed in the base in advance of the paving operations.



The Lewis float-finisher handles its double operation. The 6-batch Batch King was one of approximately 18 of these on the job. Some of them were more than two years old and they turned in an exceptional record of low-cost batch hauling. Sawing operations followed. Longitudinal jointing was handled by A. R. Reid Co., San Francisco, which also applied curing compound.



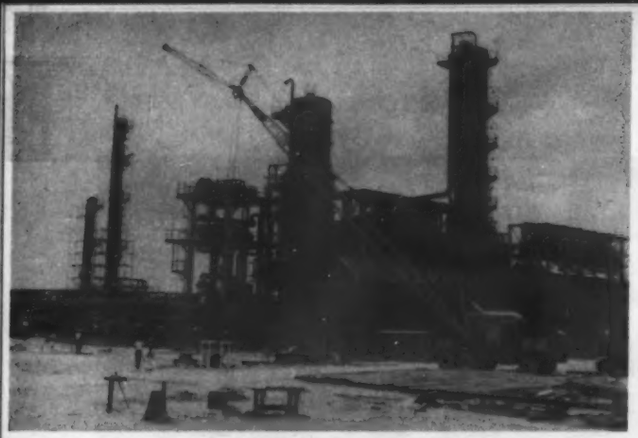
Though the contractor started sawing joints, he substituted a new preformed hollow metal joint placed by a machine built to his specifications on a B-K finisher frame by the Madsen Works. At front, a tee-bar has pneumatic vibrators. When the pointer is over a joint mark, hydraulic controls force the bar into the mix to clear a path for the joint former.



While the vibrating bar cuts a joint at the front of the 15-foot-long rig, workmen on the rear place the joint former in the last joint cut. The former has the cross section of a heavy-stemmed, narrow-flanged tee. The stem tapers to form the required joint section. On the underside of the flange of the tee, built-in ⅛-inch radii form the required edge finish.

The joint former is installed with a jig having five vise-grip wrenches. After the former is pushed into the concrete, the vise grips are snapped free. Workmen easily place two units before the machine has room to advance. Hand finishers with a long-handled float remove any irregularity after joints have been placed. The metal joint formers are removed the following day, and sealing is done later.

Materials for some 50,000 yards of concrete were batched from a Noble fully automatic plant equipped with a tri-batcher. Aggregates from a commercial plant were hauled in by Hess-Mace, Dixon, Calif., in bottom-dump trailers that dumped to a hopper. A Sierra radial stacking conveyor delivered materials to three stockpiles. THE END



This is the reason for the school's coming into existence: the $40 million Standard Oil refinery at Barber's Point on Oahu. A number of men trained in the school are on the job. The school had no admittance restrictions, aside from the number of applicants it could take, and no one was required to take a job with the contractor.

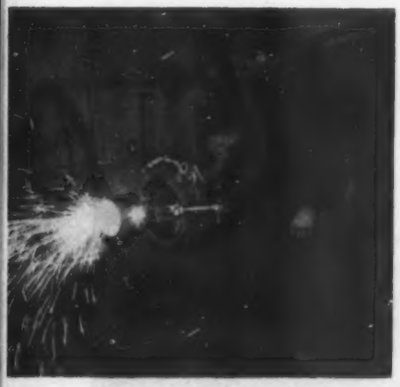
# Contractors operate

## *Training program overcomes shortage of welde on new Standard Oil Hawaiian refinery*

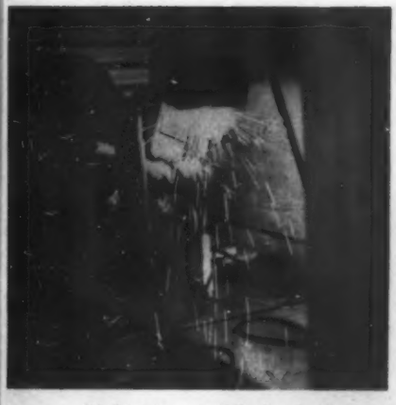
**Contractors and Engineers staff article**

Faced with the job of building the first big refinery in Hawaii, the contractor discovered that there were not enough qualified pipe welders available. Securing pipe welders from the mainland would be expensive, and there would probably not be work for them after this job was completed. What could be done?

The Bechtel-Hawaiian Dredging joint venture on the new $40 million Standard Oil Co. refinery at Barber's Point on the island of Oahu decided to train some new welders. They set



A student, learning to use an automatic pipe-cutting torch that cuts off pipe joints with a correct bevel for welding. Classes of 11 or 12 students met five nights a week for three hours and had every other week off. In the background, one of the men is using a power grinder to grind the beveled edge of a pipe stub before welding.



Working in one of the booths that confine the bright light and protect the rest of the class, a student makes a weld on a piece of pipe. The students are fairly well advanced before they start welding pipe joints like this. When instructors feel a student is ready to obtain a certificate, the student makes a test weld that forms the basis for his qualification as a welder.


## How Payscraper® "automotive" operating ease highballs your dirt-on-fill delivery

*You won't need stunt-car "jockeys" or muscle men give you the dirt-on-fill bonus the 375-hp International Payscraper rigs can deliver!* Almost all the dang hard work, and rump-bumping of rubber-tired rig o eration is engineered out of Payscraper models. A an exclusive combination of operating ease, safe and comfort features is engineered in!

**Push-button, finger-tip ease!** Your operator simp pushes a button to direct-start the DT-817 Diesel a ready 375 high-torque hp to give a cycle-speed Payscraper rim-pull of 60,000 lbs.; plus time-savi "no-lag" control power!

**Your operator pulls directly out of 90° turns**—with 34-cu. yd. heap loads on either the 2-axle "295" or 3-axle "495." Ample power and traction team with the exclusive International tandem-pump, rack-and-pinion steering to give positive, right-angle turning with full power. This finger-tip controlled system leaves the "steering feel in the steering wheel," even at the top 33.5 mph speed.

**For fast, positive dumping,** the high Payscraper apron gives you a "barn-door-like" opening up to 94 inches! The tive-acting Payscraper ejector mechanism is powered by International shock-absorbing, planet-type Cable Control One cable drum of this simple, fast acting unit actuates and ejector; the other drum positions the bowl to control ing action. Shown, the 3-axle "495" fast-dumping on the

# ipe-welding school

a welding school in the shops of the Hawaiian Dredging & Construction Co., Ltd., Honolulu, where ten Lincoln 200-amp welding generators were made available to the students. The Bechtel Co. supplied the instructor, and the joint venture supplied the scrap pipe for the practice welds.

The program was coordinated under the auspices of the Pipefitters and Steamfitters Local No. 675 of the CIO-AFL United Association. A union committee examined the applicants and set up a waiting list of those desiring to take the course.

### No strings attached

The school was open to all wishing to attend, regardless of their present employment, previous welding training, or future intentions. Some welders from the refinery job attended to improve their skill. Some employees of other general contractors or of plumbing contractors did the same. Some of the students had no previous experience or training but simply wanted to learn to weld. Others might have been expert welders wishing to qualify as pipe welders.

Graduates of the course were not obligated to go to work at the refinery, but a number of them did. This helped alleviate the critical shortage, but did not overcome it completely.

### Five nights a week

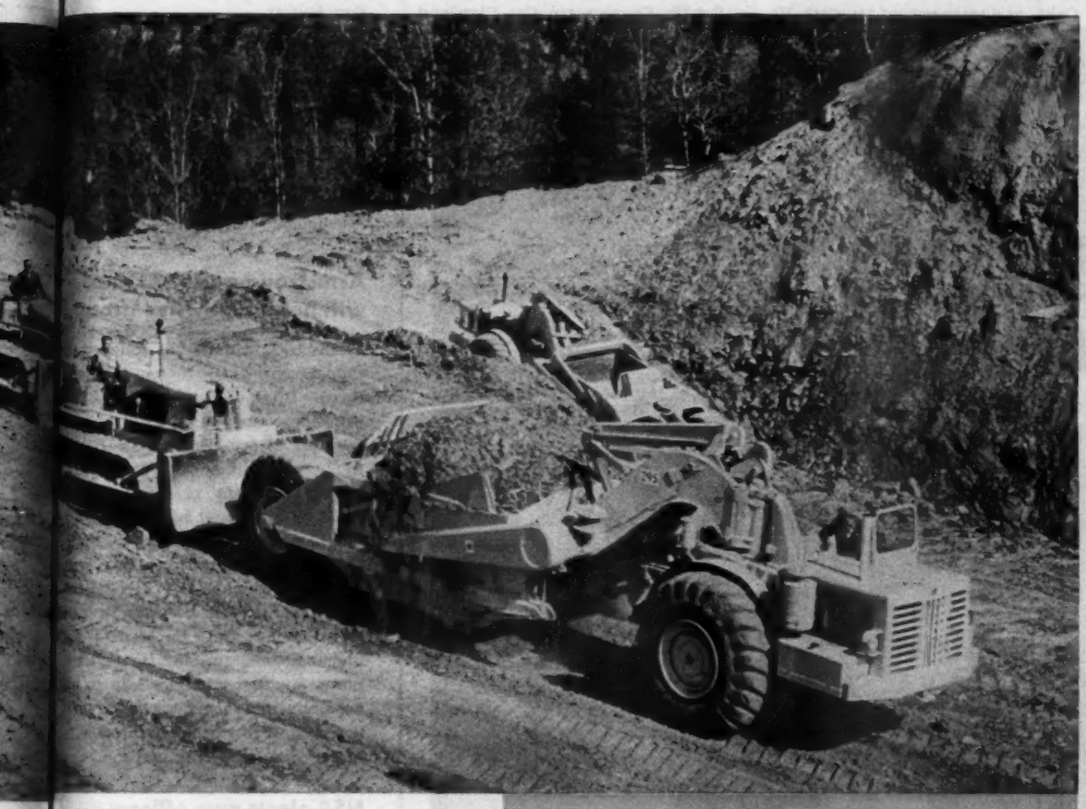
The school was operated five nights a week from 6 to 9 p.m. Each class consisted of 11 or 12 students. As soon as a student qualified or dropped out, he was replaced from the waiting list. Each class attended for a week and then had a full week off. A second class met during the alternate weeks so that there were always two classes in progress.

Beginners started by learning welding safety. Then they learned to operate the generators. The next step was a simple flat bead, and from that they worked up until they could weld full pipe joints on many sizes of pipe. A beginner put in about 30 hours before he even started on pipe. Welders with experience moved along faster.

### Certificate of qualification

When the instructor thought sufficient skill had been developed, a student was permitted to make a test weld as the basis of his certification. This weld was first X-rayed and then subjected to other tests. Strips cut through the weld were tested in bending and tension. If the weld passed the test, the student was given a certificate of qualification. If he then went out to the refinery to work as a pipe welder, he had to pass another qualification test. Some of the more experienced welders were able to pass their tests after as little as 15 hours of class work. Most of the beginners took 60 to 120 hours.

During the period of more than a year that the school was in operation, two instructors handled most of the classes. The originator of the course was Ken Pritchett of the Bechtel Corp. He was succeeded in the instructor's post by Jerry Yoshimura. Of the first 45 men certified by the school, 20 went to work on the refinery job. The contractors considered this a satisfactory percentage although it did not completely solve the manpower shortage. THE END

power-shifts the Payscraper, up or down almost easing his car into automatic drive. The 4-speed, tary-type, torque-converter transmission gives load-speeding *automatic* direct-drive lock-ups in d, third and fourth gears!

ur operator power-steers the 150,000-lb. loaded craper with automotive-like ease. He commands exclusive "mind-reading" International rack-and-n, tandem-pump steering system—plus 3-degree nd spindle pitch that improves scraper balance prevents "bucking bronco" nose-downs in high-d turns!

e controls 34 cu. yd. loads on hills, fills, turns—where—with positive-acting Payscraper air brakes. power-controls all Payscraper dirt-handling ac-, finger-tip easy, with the International PTO-en constant running cable control unit!

*nd he rides in a foam-cushioned, 15-adjustment, et seat that gives positive, selective ride-control atch luxury car comfort.*

**for yourself what it means,** in highballing your -on-fill delivery, to arm your operators with craper advantages. Prove what happens when give them the highest power-to-payload punch of 34-cu. yd. rigs—along with Payscraper operating and safety. Choose the 2-axle "295," or 3-axle 5" and let your International Construction Equip-t Distributor demonstrate!

**Up or down power-shifting**—effortless power-steering—fast power control of Payscraper dirt-handling—all help your operator give you fast "kick-outs" and get full pusher hp efficiency. The highest power-to-payload punch of all 34-cu. yd. scrapers helps highball dirt delivery. The planet-powered TD-25 and TD-24 are "pushing" for this fleet of "295's"—building superhighway!

**Here's the big torque converter transmission**—that helps Payscraper models turn 375 turbocharged hp into industry topping production! Besides providing smooth shifting and speeds for every need, this torque converter gives automatic lockup for direct, load-speeding mechanical drive in 2nd, 3rd, and 4th gears!

*International® Construction Equipment*

International Harvester Co.,
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A COMPLETE POWER PACKAGE


## T. L. Smith adds new product line

■ The T. L. Smith Co., Milwaukee, Wis., maker of truck and industrial mixers, has acquired as a subsidiary The L. O. Gregory Mfg. Co., Inc., Memphis, Tenn.

Gregory supplies batching equipment to the ready-mixed, contractors', and concrete-products market. Products manufactured include portable plants, aggregate bins, batchers, conveyors, elevated and ground-storage cement silos, and aggregate storage and handling equipment. The plants feature "unitized construction," by which the entire plant is shipped preassembled in major components.

L. O. Gregory, founder of the firm, will be sales manager of the new subsidiary. Products of the subsidiary will be sold under the trade name Smith-Gregco.

◀ For more facts, use Request Card at page 18 and circle No. 262

# Names in the News

John A. Volpe, AGC head and president of the John A. Volpe Construction Co., Malden, Mass., is the new governor of Massachusetts.

## Volpe elected governor of Massachusetts

John A. Volpe, president of the John A. Volpe Construction Co., Malden, Mass., and currently president of the Associated General Contractors of America, has been elected governor of the state of Massachusetts.

In 1956, Volpe was chosen by President Eisenhower to be the first Federal Highway Administrator. From 1953 to 1956 he served as Massachusetts commissioner of public works, directing one of the most important highway construction programs in the state's history.

## Roulac names associate

C. Dean Miller has joined the Roulac Construction Co., Pasadena, Calif., as a management associate. He was previously project engineer for the J. H. Hedrick Co.

Roulac has been engaged in commercial, industrial, and residential construction in the area since 1948.

William E. Jeffrey, new vice president for the Hunkin-Conkey Construction Co.

## Hunkin-Conkey names veep

William E. Jeffrey has been named a vice president of the Hunkin-Conkey Construction Co., Cleveland, Ohio. He will continue as general manager of the firm's buildings and industrial-construction division.

Jeffrey was deputy chief engineer of the Port of New York Authority from 1948 to 1955. Before coming to Hunkin-Conkey in February, he was associated with The Sumner Sollitt Co., engineers and builders of Chicago.

## Corps appointment

Col. John H. Kerkering is the new director of the U. S. Army Engineer Research and Development Laboratories, Fort Belvoir, Va.

Since 1958, he has been commanding officer at the U. S. Army Polar Research and Development Center in Fort Belvoir.

Ellis L. Armstrong, who has resigned as commissioner of the Bureau of Public Roads, will become president of the Better Highways Information Foundation.

## Armstrong quits BPR post; will head highways group

Ellis L. Armstrong has resigned as commissioner of the Bureau of Public Roads, U. S. Department of Commerce, Washington, D. C., to assume the post of president of the Better Highways Information Foundation, a private nonprofit organization devoted to a national highway education campaign.

Since 1958, Armstrong has been second in command to Federal Highway Administrator Bertram D. Tallamy in directing the federal-aid highway program in the United States and its territories. Prior to his appointment as commissioner of public roads, Armstrong was director of highways for the state of Utah.

## NSA elects new officers

■ The National Slag Association elected officers for 1961 at its 43rd annual meeting in Washington, D. C.

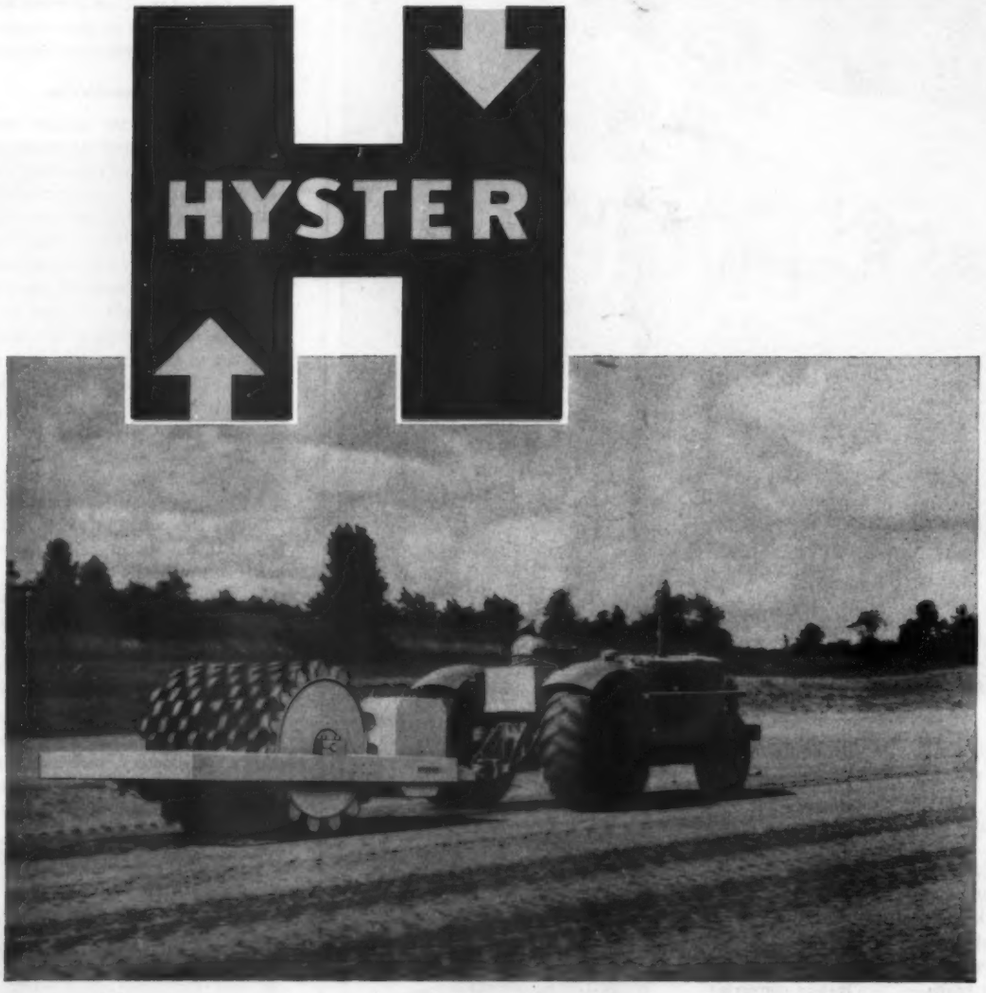
The following were elected: president, Edward C. Levy, president of the Edward C. Levy Slag Co., Detroit, Mich.; vice president, George W. Lanier, vice president and general manager, Houston Slag Materials Co., Houston, Texas; treasurer, W. S. Shaw, vice president, Munsey Trust Co., Washington, D. C.; managing director-secretary, E. W. Bauman, Washington, D. C.

## M-C&S names three

Merritt-Chapman & Scott Corp., New York, N. Y., has named Edwin A. Pasha project manager for the final phase of construction of the Niagara Power Project's main generating plant at Niagara Falls, N. Y.

In his new position, Pasha succeeds Robert I. Senn, who will serve as project manager for the company's portion of the work in constructing a 17½-mile bridge-tunnel across Lower Chesapeake Bay.

Since June, 1958, Pasha has been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**HYSTER® has it!**

Contractors report:

- New Hyster Model D Tamping rollers get compaction at speeds to 15 MPH.
- High speed rolling cuts compaction costs to less than three cents per cubic yard.
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Ask your Caterpillar-Hyster dealer for a demonstration soon.

*Cat and Caterpillar are registered trademarks of Caterpillar Tractor Co.*

TRACTOR EQUIPMENT DIVISION—Construction and logging equipment
INDUSTRIAL TRUCK DIVISION—Lift trucks, mobile cranes, straddle carriers
MARTIN TRAILER DIVISION—Heavy machinery hauling trailers
INTERNATIONAL DIVISION—Overseas manufacturing, sales and service
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TRACTOR EQUIPMENT DIVISION
P. O. Box 328 • Peoria, Illinois

For more facts, use Request Card at page 13 and circle No. 253

project manager on Merritt's separate contract for the Niagara Power Project's intake works and first waterways section. He is succeeded in that post by Thomas Slattery, formerly assistant project manager.

## Ford, Bacon & Davis adds market analyst

Lawrence J. McDevitt has joined the staff of Ford, Bacon & Davis, Inc., consulting engineering firm of New York City, as a supervising engineer specializing in sales and marketing analysis.

For the past 15 years, McDevitt had served as a marketing and sales specialist for major steel companies.

## M & T controller

Douglas McArthur, formerly with the accounting firm of Peat, Marwick, Mitchell & Co., has been appointed controller for the M & T Co., Philadelphia, Pa.

M & T, a management engineering firm, serves a variety of fields including industrial, petroleum, chemical and mining, aeronautical, electronics, and missiles.

## Ebasco names consultant

The management consulting, engineering, and construction firm of Ebasco Services, Inc., New York, N. Y., has named Albert H. Foster general management consultant. Foster comes to his new post from a long career in the consulting field, with assignments at home and abroad.

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## Asphalt paving group publishes proceedings

■ The proceedings of the Association of Asphalt Paving Technologists for 1959 is now available in book form.

Such subjects as paving asphalts, aggregate gradations, fillers, stability, density, pavement failures, fatigue tests, chemical composition of asphalts, mixing efficiency, and durability are covered by the 17 papers.

Copies may be obtained by writing to Ward Parr, Secretary-Treasurer of the association at 1224 E. Engineering Bldg., Box 619, Ann Arbor, Mich. The price per copy is $6.50, post paid.

## Concrete curtain walls subject of new PCA film

■ The Portland Cement Association, Chicago, Ill., has released "Concrete Curtain Walls," a new 16-mm sound and color film describing the use of precast-concrete panels in sheathing buildings.

Especially suitable for showing to architects, engineers, contractors, and business and civic groups, the film illustrates the use of concrete curtain walls in structures ranging from single-story commercial and industrial buildings to skyscrapers. It shows the wide range of choices offered architects in color, design, and texture.

The 18-minute film is available on loan through PCA's 34 district offices located in major cities of the United States, and in Vancouver, B. C.

A WORKMAN PULLS FORM STAKES with a Cleveland pin puller on a section of Interstate highway near Jacksonville, Fla. Work on the 1.5-mile stretch was handled by Duval Engineering & Construction Co., Jacksonville.

How many "machines" is a MODERN LOADER?

JOB-PROVE the 4-in-1 and see . . .

**Here's what the 5 Four-in-One's,** shown, are doing: (1) (Left foreground) The 3-cu. yd. TD-20 rig is 'dozing; (2) (Right foreground) The ¾-cu. yd. T-340 outfit as "carry-type scraper;" (3) (Right center) The 1½-yd. TD-6 4-in-1 "semi-skids" load on its skid shoes; (4) (Center): This 2¼-cu. yd. TD-15 "biting bucket" clam-handles a stump; (5) (Rear) TD-9 rig is back-dragging gravel!

**It's a whole equipment spread** of job-getting actions, if it's "the bucket with the bite"—an exclusive clam-action International Drott 4-in-1.

"Dragonized" to dramatize "the bucket with the bite," the five 4-in-1 sizes above demonstrate *plus* actions you get with the exclusive clamshell.

Full-capacity, full-range, depth-controlled bulldozer performance. "Carry-type scraper" action to grade, strip, or spread with inch-close accuracy. Skid-Shovel action to "semi-skid" full buckets of material. Controlled back-dragging clam-action, to grade, pick up, or pull down materials. "Clamming-on" action to grab and load heavy unwieldy "impossibles."

Note also the 4-in-1 gives you the top excavator-loader performance on the market! That includes certified break-out forces ranging from 11,200 lbs. with the T-340, to 43,150 lbs. with the TD-20. And only the 4-in-1 gives you clam-type bottom dumping—that ends sticky materials loading problems, for good!

*See for yourself how many "machines"* the only *modern* loader is! Move the 4-in-1 machine-action selector lever. Prove you get a whole spread of money-making actions, that obsolete "single-action" loaders, and double for a yard-full of limited-duty rigs! See your International Drott Distributor for a 4-in-1 demonstration.

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL® DROTT®

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Special drilling rigs sink horizontal wells to intercept and remove water from behind this slope during work on the new 4-lane highway that will carry through traffic now using The Redwood Highway in California. Horizontal drains were installed under a subcontract. The drills, on a TD-6, background, and a Cat D2, can drill up to 500 feet horizontally in 10-foot increments, but on this work the maximum was 300 feet. Holes will be cased with 2-inch perforated pipe with welded joints.

*(Additional photo on front cover)*

# Subdrains stabilize new highway grades

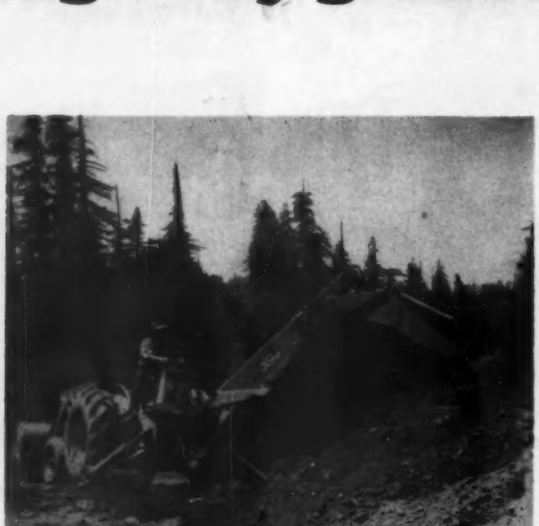
**Contractors and Engineers staff article**

Huge redwood trees—the oldest living things on earth—still grow in a series of spectacular groves along the northern California coast. Traversing this area from Oregon to the Golden Gate is U. S. 101, The Redwood Highway. A section of this scenic route, appropriately called the Avenue of the Giants, winds its way between the towering trees that stand so thick, only an occasional shaft of sunlight reaches the ground.

Tourists flock to this awe-inspiring area in great numbers—so great, in fact, that the narrow, winding road is no longer able to handle the traffic. In recent years, the California Division of Highways, by a series of contracts, has been building a new 4-lane highway skirting the groves to carry through traffic quickly and safely. The Avenue of the Giants will remain for those who come to admire the groves.

One of the current contracts in this series provides for the construction of 7.509 miles of freeway from Myers Flat to a point two miles north of the town of Weott, and skirting it. The general contractor for this $5.5 million project is the Morrison-Knudsen

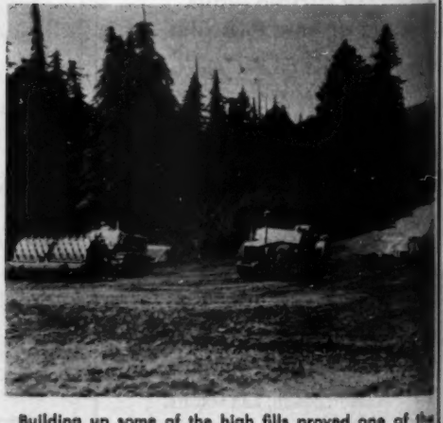
Water for cleaning out the holes is supplied to the drill rigs by a tank truck. Each unit has its own pump to handle water. Drill rigs were designed and built in the subcontractor's shops.



A Ford hydraulic backhoe is used to dig a trench for an underdrain. The project includes some 10 miles of 8-inch perforated underdrain, some of it along edges of cuts to remove ground water that would seep under the roadway.

Rugged country and steep haul roads are taken in stride by scraper and tractor operators. A Euclid S-18 is pushed in one of the cuts by a Euclid TC-12 tractor with Ateco ripper. Rippers are used to break up the hard material for the scrapers in this area.

In another less rocky cut, a Curtiss-Wright CW226 scraper is pushed by a TC-12, and a TS-24 works not far behind. Two scraper spreads handle the 2.75 million cubic yards of excavation, which was increased by 200,000 yards because of slides during the work.



Building up some of the high fills proved one of the most difficult parts of the job. This fill is well along. One of the Euclid TS-24 scrapers unloads as another heads onto the fill, which is being worked by Cat D8's, one pulling a double-drum sheepsfoot roller.

Co., Inc., Boise, Idaho, operating through the district office in Seattle, Wash.

The contract includes grading, drainage, cement-treated base, bituminous paving, and two highway interchanges. The finished roadway over most of its length will be a 60-foot-wide, all-paved section. This is made up of four 12-foot travel lanes, a 4-foot paved median, and two 4-foot outside shoulders. Access is restricted throughout the length, except for the interchanges at Myers Flat and Weott.

### Slides a major problem

In this mountainous area of heavy winter rains and unstable soils, the very water that sustains the tremendous redwood groves creates the biggest problems in highway construction. Through the rainy winters, slides are common throughout the area. When the ground is disturbed by grading operations, more slides are inevitable.

While slides did occur during construction, important steps were taken to stabilize the slopes and hold future sliding to a minimum. Among these measures was the installation of more than 10 miles of 8-inch perforated metal-pipe underdrains, the construction of more than 100,000 linear feet of 2-inch horizontal drains, and the placing of some 200,000 tons of filter gravel in the base of embankment areas.

When unsuitable material—usually wet blue clay—was encountered in the areas where embankments were to be placed, this material had to be removed, aerated, dried, and replaced. When the material had been excavated, and before any of the new embankment was placed, a lift of filter material 3 to 5 feet deep was placed on the bottom and slope of the excavation.

An 8-inch perforated metal drain pipe was embedded in the filter material at the bottom of the excavation and outletted to a natural drainage channel. Then the embankment was built up with the processed excavated material, plus material from adjacent cuts.

More than half a million cubic yards of this trench excavation for stabilization of the embankments was made, and more than 200,000 tons of filter gravel was placed. This was a tremendous job, since these trench excavations had to be made at the bottoms of deep valleys and on steep hillsides where access was extremely difficult. M-K made good use of its twin-engined Euclid TS-24 scrapers on this operation.

Other 8-inch perforated drains were placed along the edges of cuts to intercept ground water that would otherwise seep under the roadway. Many of these drains also extend across the roadway to find gravity outlets.

### Drill horizontal wells

Horizontal 2-inch perforated drains were installed at the base of some cuts and on some of the benches of the higher cuts to intercept water that might build up and cause slides. This work was sublet to a specialist, Anderson Horizontal Well Drilling Co., Petaluma, Calif.

Anderson moved in three special drilling rigs designed and built in its own shops. These were mounted on small Cat D2 and International TD-6 tractors. A horizontal device is mounted on the side of each tractor to push the drill rod horizontally as it rotates. The tractor engines furnish the power. The rigs also carry pumps for injecting water to wash the drillings out of the holes.

Using BW hollow 1½-inch drilling rod in 10-foot lengths and Varel V2

(*Continued on next page*)

This small Onan portable generator set with floodlights on elevated poles provides light where needed during night operations. Several units like this were on the job, which ran two 9-hour shifts per day.


17 years of continuous operation... plant still has original engines!

**Here's another record** of trouble-free International power on a heavy-duty construction job. Three 17-year-old International UD-18 diesel engines are still producing efficient power on Hot Mix Plant No. 1 for Kelley & Meyer Co., Youngstown, Ohio. One engine powers mixer, hot elevator and screen, another one drives the cold elevator and dryer, while the third powers the dust collector and 3-ft., 6-bladed fan. The company has 11 IH engines in operation, plus one standby unit, on four asphalt plants in Ohio and Pennsylvania.

**"Years of experience** with International engines has proven their ability to power a plant to maximum production with real day-in-day-out dependability," says Plant Superintendent Clyde Clabaugh. "These three old engines have put out over half a million tons of hot mix, and all they ever require is normal maintenance. With a record like that, I personally think International power can't be beat!"

**Contractors all over the country** use dependable International engines for maximum efficiency on their construction equipment. You too, can profit from the many advantages in the full line of International's diesel and carbureted engines—16.8 to 385 max. hp. Call your International Engine Distributor or Dealer soon and find out how little it will cost you to power—or re-power—your equipment with International.

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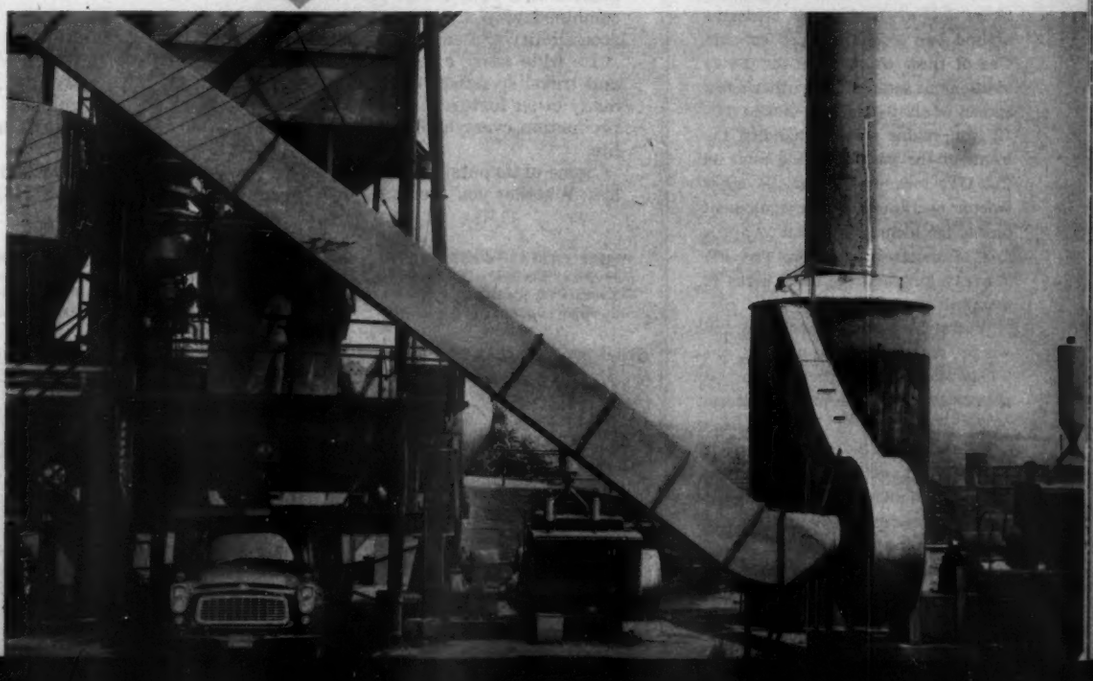



For more facts, use Request Card at page 18 and circle No. 265 ▶

Resident engineer H. W. Benedict, left, and general superintendent Mitchell Humphries meet out on the job to talk over some of the difficult soil conditions encountered.

(*Continued from preceding page*)

3⅛-inch cone bits, these rigs can drill as much as 500 feet into the mountainsides. The maximum holes on this project were about 300 feet deep.

After a hole was drilled, a 2-inch perforated metal pipe was pushed in. The joints were welded as the pipe was installed. These wells pick up water far behind the face of the cuts, thus stabilizing the slopes and helping to eliminate slides.

In spite of all of the efforts, there were some slides during the work, and they increased the estimated 2.75 million cubic yards of excavation by some 200,000 cubic yards. In one instance, the alignment was changed and a short section of the road redesigned because of the water and unstable soil conditions.

This was a tough grading job, with nearly 3 million yards of dirt and rock to move in this area of steep mountainsides and deep valleys, and with the many complications caused by the unstable soils. Furthermore, the working season is not too long in this area, where the heavy winter rains put a complete stop to earthwork operations from late fall to late spring.

Under these conditions, M-K moved in a lot of equipment centering around two Euclid scraper spreads. One of these consisted of six TS-24 twin-engine scrapers. The other was a spread of six S-18's. Five Euclid TC-12 twin-engine tractors handled the brunt of the pushing, while some 14 Cat D8's took over all of the other tractor operations. Other equipment on the job included two Cat 12 and a Cat 14 motor grader, two Cat 977 Traxcavators, and the usual array of supplemental machines.

Where the material was hard and where rock was encountered, the TC-12 tractors used their Ateco rippers to break up the material ahead of the scrapers.

The powerful TS-24 scrapers proved their worth in getting up some of the very steep haul roads without assistance. This was especially important in making the initial cuts at the tops of some of the high cuts, and in taking out unsuitable material in preparation for stabilizing the foundations of the deep fills.

Finding places to put the material —especially what had to be aerated and dried—was a problem. A considerable amount of this material had to be rehandled. Where the project alignment cut through portions of the redwood groves, the contractor was confined to the right-of-way. In this rough country, it would often have been easier to use roundabout routes.

### Maintenance

With this big fleet of rubber-tire scrapers, tire maintenance was very important. M-K handled its own field service of the tires, and all repairs and recapping were done by Mel Goodin, Portland, Ore.

Two lube crews with mobile rigs lubricated the entire spread each night after the second 9-hour shift. This crew also serviced air cleaners, fuel and oil filters, etc.

Keeping the rigs fueled required four visits a day from the 4-wheel-drive Dodge fuel truck. This rig, carrying 1,000 gallons of diesel fuel and 250 gallons of gasoline, serviced all of the equipment during lunch hours, at the break between shifts, and after the late shift.

A field shop handled all major repairs, as well as the minor repairs and the preventive-maintenance program.

The supervisory staff for Morrison-Knudsen included project manager Jack Coons, general superintendent Mitchell Humphries, project engineer Gordon Robinson, assistant superintendent Al Gellert, and master mechanic Jim Cheska.

The project was supervised by the Eureka District of the California Division of Highways, for which Sam Helwer is district engineer. The state was represented on the project by resident engineer H. W. Benedict and assistant resident engineer Mel W. Berning. THE END

# New Barber-Greene SA

## Latest addition to Barber-Greene Finisher line is a new step forward in advanced design and superior performance.

Barber-Greene's Model SA-40 is a new achievement in ease of operation and automatic features, combined with simple construction for greatest accessibility and ease of maintenance.

Its wide range of paving speeds to 100 F.P.M. and travel speeds to 4 M.P.H., together with its many other features assure the greatest tonnage production every hour—day and year of its long life.

Some of its outstanding features are shown below. Whether you are in the market now or not, you should be familiar with all of the advantages of this completely new modern design. Your Barber-Greene distributor will gladly give you full information. No obligation.

**Only Barber-Greene Offers You Five Choices**

**COMPACT:** Model 873, paves on crawlers, travels on rubber.

**GENERAL DUTY:** Model 879-B and new Model SA-40.

**HEAVY-DUTY:** Model SA-60 on Crawlers and Model SB-60 on Pneumatics.

**NEW EASE OF OPERATION.** Joystick, power-assist steering. Switches on joystick control self-dumping hopper, screed hoist, etc.

**HYDRAULICALLY SELF-DUMPING HOPPER.** Tunnel extends to rear of chassis for maximum capacity and fastest truck dumping. Hopper gates controlled from screed platform while paving.

**HEAVY-DUTY LONGER L… SCREED.** Hydraulically operated, … speed tamper compacts before … off. Improved automatic leveling. … screed heaters.

## Booklet, film discuss water conservation

■ The problem of water shortage through waste of our national water resources, with a resulting increase in our water bill, is examined in "Water Bill U. S. A.," a new 16-page booklet released by the Caterpillar Tractor Co.

The booklet tells the story of water and discusses ways in which our national water problem can be met by means of better farming practices and watershed control programs.

Copies may be obtained from Caterpillar dealers or by writing to the Advertising Division, Caterpillar Tractor Co., Peoria, Ill., and requesting Form D041.

A 16-mm sound and color film by the same title, produced by the company in cooperation with the U. S. Department of Agriculture, is available from the same sources.

## Soil-mechanics book has papers by Terzaghi

■ John Wiley & Sons has published "From Theory to Practice in Soil Mechanics," a book of selections from the writings of Karl Terzaghi, who established and developed this new branch of engineering science.

The book, prepared by Arthur Casagrande, Laurits Bjerrum, Ralph B. Peck, and A. W. Skempton, contains Terzaghi's papers on the aim, scope, and methods of soil mechanics; and selected professional reports and papers that show how Terzaghi arrived at solutions to foundation, landslide, tunneling, and earth-dam problems. His life and achievements are discussed by the authors, and a bibliography of his works is also included.

The 425-page book is available from John Wiley & Sons, Inc., 440 Park Ave. South, New York 16, N. Y., at a price of $12.

# Convention Calendar

**December 5–7 Associated General Contractors of America**
New York State Chapter 35th annual meeting and exhibition, Concord Hotel, Kiamesha Lake, N. Y. Louis G. Blackhall, managing director, AGC, Manger De Witt Clinton Hotel, Albany, N. Y.

**January 9–13, 1961 Highway Research Board**
Annual meeting, Sheraton Park Hotel, Washington, D. C. Fred Burggraf, director, HRB, 2101 Constitution Ave., Washington 25, D. C.

**January 16–18 Conference for Land and Construction Surveyors**
Conference, Pennsylvania State University, University Park, Pa. Continuing Education Conference Center, Pennsylvania State University, University Park, Pa.

**January 17–19 National Limestone Institute**
Annual convention, Statler Hilton Hotel, Washington, D. C. Robert M. Koch, president, NLI, 210 H St. N.W., Washington, D. C.

**January 17–20 National Crushed Stone Association**
Annual convention, Americana Hotel, Miami Beach, Fla. J. R. Boyd, executive director, NCSA, 1415 Elliot Pl., Washington, D. C.

**January 18–20 National Concrete Contractors Association**
Annual convention, Diplomat Hotel, Hollywood, Fla.

**January 21 National Ready Mixed Concrete Association**
Annual meeting, Exhibit Division, Americana Hotel, Miami Beach, Fla. V. P. Ahearn, secretary, NRMCA, 1411 K St. N.W., Washington, D. C.

**January 23–26 National Sand and Gravel Association and National Ready Mixed Concrete Association**
Forty-fifth NSGA annual convention, 31st NRMCA annual convention, Americana Hotel, Miami Beach, Fla.

**January 23–26 Plant Maintenance and Engineering Show and Conference**
Exhibit, International Amphitheatre, Chicago, Ill. Clapp & Poliak, 341 Madison Ave., New York 17, N. Y.

**January 25–27 New York State Highway Superintendents Association**
Winter meeting, Sheraton-Ten Eyk Hotel, Albany, N. Y. H. R. Madison, secretary, NYSHSA, 1420 Western Ave., Albany, N. Y.

**January 30–February 2 National Bituminous Concrete Association**
Sixth annual meeting, Shamrock Hotel, Houston, Texas. H. K. Griffith, executive director, NBCA, 1145 19th St. N.W., Washington 6, D. C.

**February 5–9 Associated Equipment Distributors**
Annual convention, Statler-Hilton Hotel, Los Angeles, Calif. W. G. Bowman, convention manager, AED, 30 E. Cedar St., Chicago, Ill.

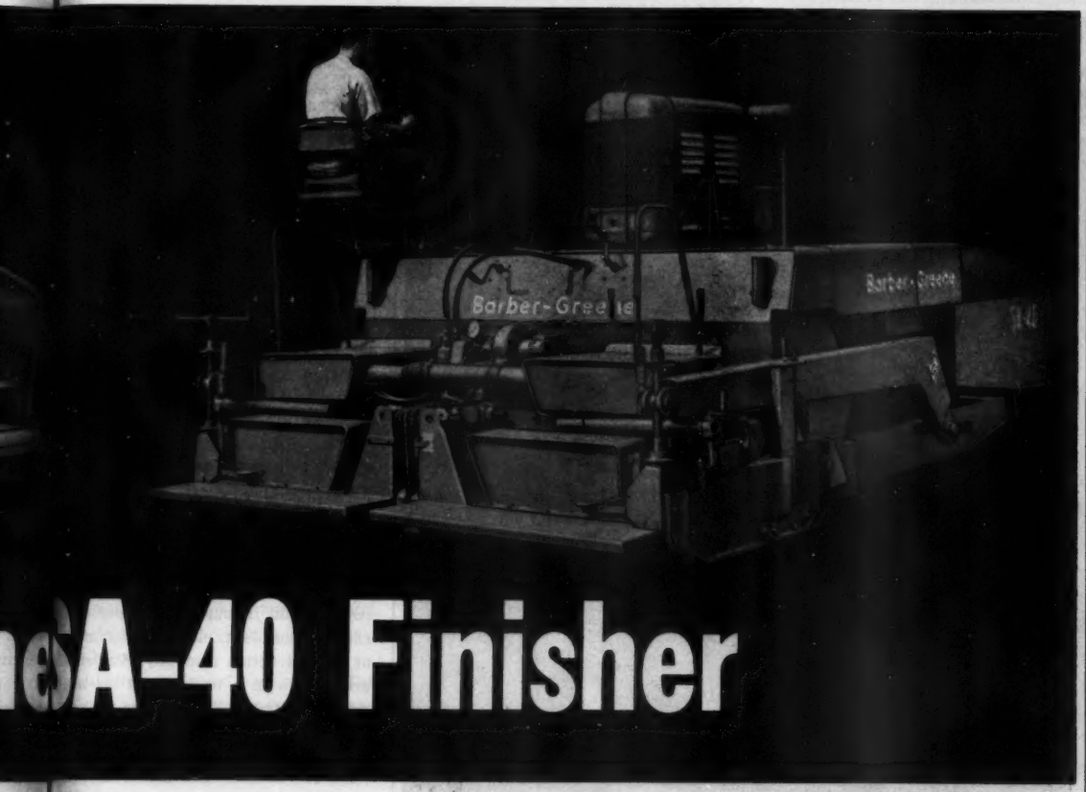
**February 6–8 Association of Asphalt Paving Technologists**
Meeting, Hotel Francis Marion, Charleston, S. C. Ward K. Parr, secretary-treasurer, AAPT, 1124 E. Engineering Bldg., University of Michigan, Ann Arbor, Mich.

**February 23–24 Mississippi Highway Conference**
Seventh annual conference, Center for Continuation Study, University of Mississippi, Oxford, Miss. W. M. Jones, Jr., director, department of Conferences and Institutes, MHC, University of Mississippi, Oxford, Miss.

**February 27–March 2 Associated General Contractors of America**
Annual meeting, Statler-Hilton Hotel, Boston, Mass. James D. Marshall, executive director, AGC, 20th and E Sts., Washington 6, D. C.

**February 28–March 2 Illinois Highway Engineering Conference**
47th annual conference, Illini Union Bldg., University of Illinois, Urbana, Ill. John W. Hutchinson, assistant director, IHEC, 304 Civil Engineering Hall, University of Illinois, Urbana, Ill.

◀ For more facts, use Request Card at page 18 and circle No. 266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Model SA-40 paves standard 10' widths—variable from 8-14'. Handles all asphalt mixes. Carries shift-long material supply in 28-gal. tank.

*World's No. 1 Manufacturer of Asphalt Paving Equipment*

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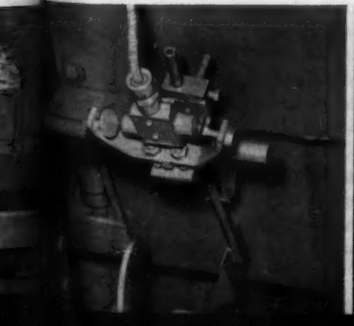
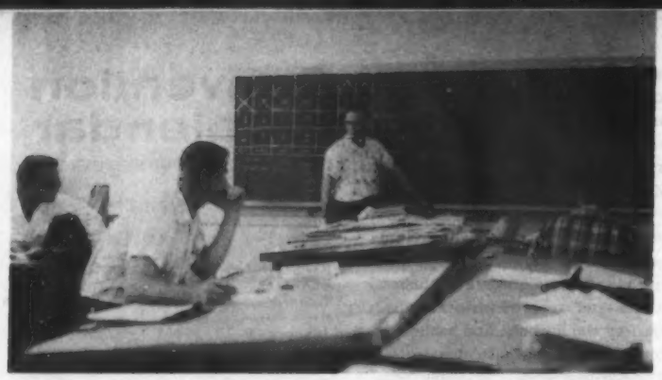
**AUTOMATIC FEEDER CONTROL** operates each pair of feeders and screws independently. Override switches on steering column.

**OSCILLATING PUSH ROLLERS** pick up trucks on-the-fly regardless of alignment. New long crawlers provide the ultimate in traction, leveling, and stability.

**SIMPLIFIED SERVICING** achieved through unitized construction and simple, efficient power train. Hinged deck plates for easy perimeter access.





# Texas A. and M. teaches construction

Two types of construction courses are currently being offered by Texas A. and M.—a 5-year program in architectural construction and a 5-year combined course in civil engineering and business administration. This class in steel structures is being taught by Charles J. Godwin, assistant professor of architecture and a coordinator of the construction course. Certain of the architectural courses are slanted to the construction group and taught to these students separately.

**Contractors and Engineers staff article**

Universities throughout the country are becoming increasingly aware of the need for preparing young men to enter the field of construction. A pioneer in this area is the Agricultural and Mechanical College of Texas, which has developed two specialized courses of instruction for the industry.

The course most specifically directed toward construction is a 5-year program for students interested in building construction. This is basically an architectural course slanted toward the needs of builders. The more practical aspects of engineering and business administration are taught as a part of the program. Students graduate with a bachelor of science degree in architectural construction.

For men who want to enter the construction industry with an engineering degree, the college offers a 5-year combined curriculum in civil engineering and business administration. This course of instruction gives the student a good background in engineering and in business methods—a combination desirable for supervisors of a construction company. Students graduate with a bachelor of science degree in civil engineering, as well as a degree in business administration.

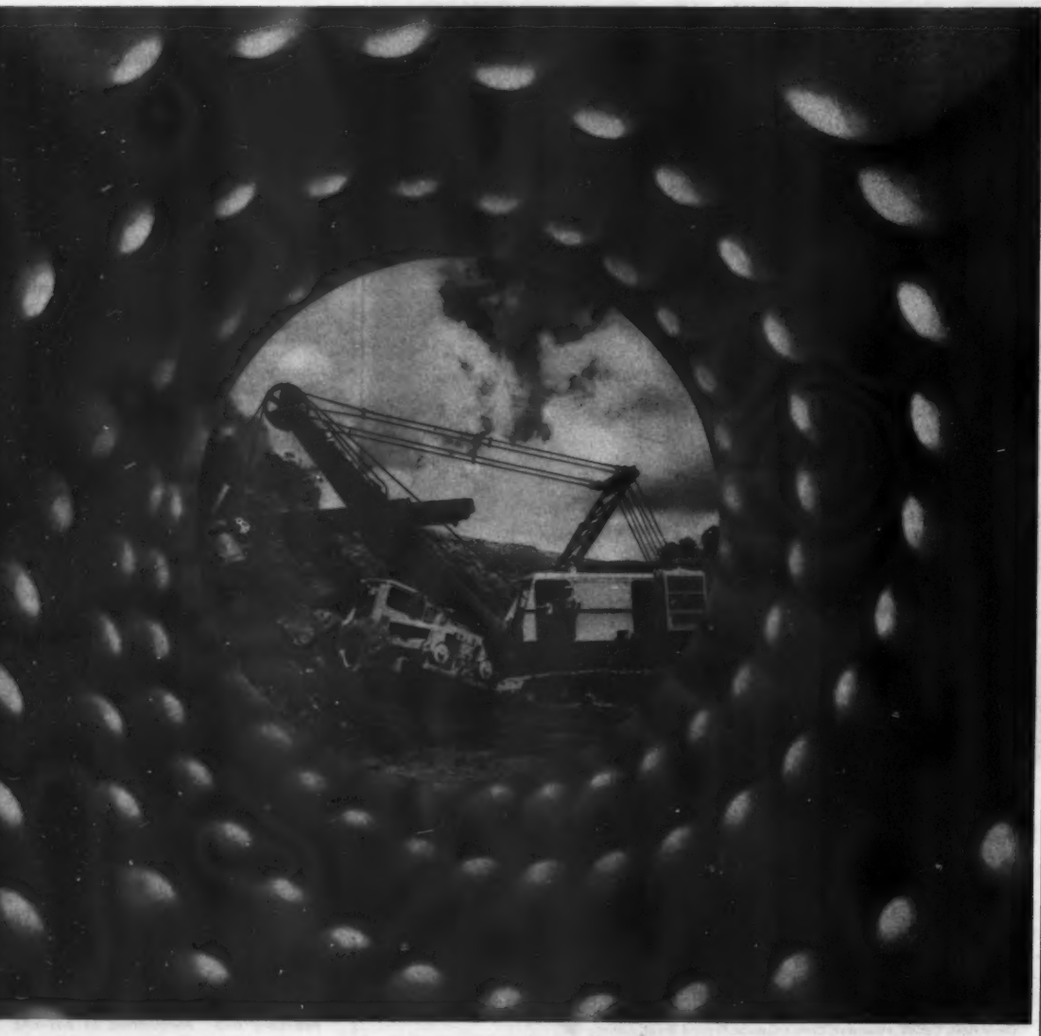
### School for builders

The Architectural Division of the School of Engineering is turning out about twenty graduates each year in the building construction field. A large percentage of these men find work with contracting firms. From the reports that come back to the college, the contractors are satisfied with the kind of men they are getting.

On the campus at College Station (near Bryan), construction students generally take six or seven courses each semester for ten semesters over a 5-year period. During the summer between the fourth and fifth years, they are required to work for a building contractor. In practice, about 90 per cent of the students work for contractors every summer during the 5-year program. This considerable amount of on-the-job experience is of great value to the young builder.

### The construction option

Students in the Division of Architecture are composed of two groups —those taking the "construction option" and those taking the "design option." The construction option is designed to train men for building construction. The design option is a straight architectural course.

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For the first two years of instruction, the content of the design and construction courses is practically identical. After the second year, the curriculum is changed to fit the special needs of the construction student. Architectural courses are slanted to meet the needs of its students. Some courses in architecture are split into two groups—one for the design students and one for the construction students.

Basically, the curriculum for the construction students is a mixture of architecture, engineering, and business administration. The emphasis is on architecture, with a total of 24 single-semester courses. Civil engineering accounts for six courses, and business administration accounts for four.

The basic subjects of mathematics and physics are not neglected. The student gets three courses in math that take him through integral calculus, and two courses in physics. To make sure that these young builders can express themselves clearly, both on paper and with the spoken word, five courses in English are prescribed. Six elective courses are also taken.

#### Geared to construction needs

Certain courses are particularly geared to the needs of building. Supers who are old hands will be glad to hear that one of the first things a student learns is how to drive a nail. This comes in the freshman year under the somewhat glorified title of Mechanical Engineering 105. In this course of carpentry and mill work, a student learns how to use hand and machine tools for simple wood construction.

In the advanced courses of the fourth and fifth years, a student picks up some mighty handy knowledge. There's an architectural course in specifications and working drawings. The student not only learns how to read working drawings, he draws isometrics from the working drawings. He learns how to make shop drawings. He also tries his hand at writing specifications. In a civil engineering course in Cost Estimating, he practices making approximate and detailed estimates of the cost of different types of construction projects. In a course on Construction Plant and Methods, he learns about plant and equipment selection for earthwork, foundations, concrete, and structural steel, based on performance and economy.

#### Business courses important

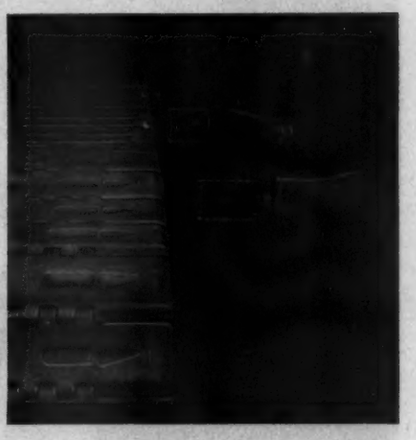
The successful operation of a construction company is based on sound business principles. In the construction curriculum, a student is introduced to these principles in four business administration courses: (1) Business Law, (2) Survey of Accounting Principles, (3) Real Estate, Titles and Conveyances, and (4) Business Management.

A valuable course, taken from the Department of Industrial Engineering, is the one on Labor and Industry.

*(Continued on next page)*

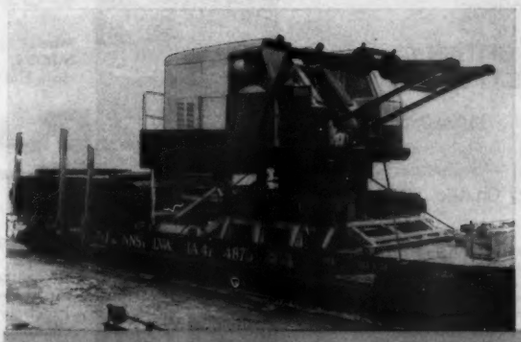
Dick Hidell, of Hidell Builders Supply, Austin, explains advantages of certain types of hardware to a Technology of Materials class. He is one of those from industry occasionally invited to speak before classes.


# New 80-ton crane features faster, simpler removal of side frames for easier shipping



The new Lorain 880 Crane has long, wide, heavy crawlers with an all-new way to remove side frames. Unique telescopic axles actually *slide out* of the frames . . . instead of frames being dragged off axles. The *complete* frames are then quickly lifted to car or truck.

A jaw clutch between the chain drive sprocket and the horizontal propelling shaft enables the side frame to be removed without "breaking" the tread belt or the drive chain. It all comes off in one piece—and goes back the same way.



**Easy transportation.** The superstructure rests on blocking on car or truck. For fast reassembly, the "880" easily swings the assembled side frames and treads into position so that the slide stub axles may be pulled into them.

**Plus other output boosting features.** Simultaneous boom derricking or lowering with hoist and/or swing. Square-Tubular-Chord Boom with open-throat boom head to eliminate block fouling. "Joy-Stick" air-power turntable controls. Air-power crawler controls. "Shear-Ball"® turntable connection is warranted for 10 years. Three tread widths: 34", 44", and 48".

These outstanding features are also available on the 70-ton Model 870 crane, clamshell or dragline.

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**PLANTS:** In Lorain, Elyria and Bucyrus, Ohio . . . **PRODUCTS:** Power shovels, draglines, clamshells, and hoes from ⅜- to 2½-yard capacity • Cranes from 7 to 80 tons . . . on crawlers, and as rubber-tire Moto-Cranes, and Self-Propelled Cranes • Rubber tire front-end Moto-Loaders in 6000-lb. and 7000-lb. carrying capacity . . . **OUTLETS:** Lorain products sold and serviced by 249 distributor outlets throughout the world.

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Prof. T. R. Holleman is head of the Division of Architecture, which handles the course that is given in architectural construction at the college.

Dr. S. R. Wright is professor of civil engineering and head of the department, which gives the combined course in civil engineering and business administration.

(Continued from preceding page)

In this course, the student studies fundamental federal and state laws governing labor-management relations, current interpretations of labor laws, and controversial labor-management issues and their solutions.

The courses are occasionally given additional interest and meaning when men associated with the construction industry are invited to speak before a class. Specialists representing suppliers, architects, and contractors bring their own personal working knowledge to a group.

### Student AGC chapter

A student's interest in construction is increased through his participation in the student chapter of Associated General Contractors at Texas A. and M. Formed in 1949 under the sponsorship of the Houston AGC chapter, the student chapter is one of two in the United States. It is composed of about 40 architectural construction students and 20 civil engineering students, who meet twice each month to hear speakers from construction and industry. Twice each year, the group goes on a 2-day field trip to inspect various projects throughout the state.

With the well balanced curriculum, the visiting speakers, the field trips, and the summer work, students of architectural construction receive a sound background in construction. The only thing that the course lacks is status. It is not accredited. This is because it is a relative newcomer to the field of education. Architectural construction is a bastard child that neither architects nor engineers want to take into their home.

Because the course is not accredited, a graduate finds it more difficult to get his license as a registered engineer or as a registered architect. In the state of Texas, a graduate from a 4-year civil engineering course has only to practice in his field for four years to qualify for a license. The construction graduate of this 5-year course must work in his field for an additional five years, and then pass two exams before getting a license.

When it is important for a construction man to become registered, this ruling is a considerable handicap. Some of the men from the construction course at Texas A. and M. go


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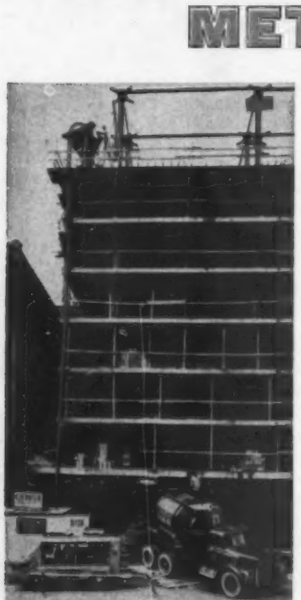

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into large oil companies. These men have found that becoming a registered engineer or architect is helpful for their advancement. For men working with construction companies, the registration is generally of little importance.

### Civil engineering plus business

The combined course in civil engineering and business administration does not suffer from lack of status. Graduates can get their registration after four years of work in their field —and without an examination.

During the first two years of the 5-year combined courses, the student takes basic courses in mathematics, chemistry, physics, and engineering. His education is broadened with studies of English and history. The third year is largely devoted to courses in civil engineering.

During the last two years of his training, a strong emphasis is placed on business administration. In addition to the eight courses in civil engineering, the student receives the benefit of twelve courses in business administration.

The business courses are chosen to fit the needs of a supervisor in a construction company. The student learns the basic methods of cost accounting. His background knowledge of business is increased through such useful courses as Purchase and Control of Materials, Money and Banking, Business Law, Insurance, and Business Management.

### Management courses

Some of the more advanced engineering courses pertain to the management of a construction company. A course in Engineering Economy analyzes the operating costs of engineering projects—costs represented by interest, depreciation, fixed costs, and overhead. A similar course in Cost Estimating gives practical instruction in the methods of estimating costs of earthwork, foundations, masonry, and steel. Taken from the Industrial Engineering Department is a course in Motion and Time Study. The course should be useful to a supervisor attempting to make his field operation more efficient.

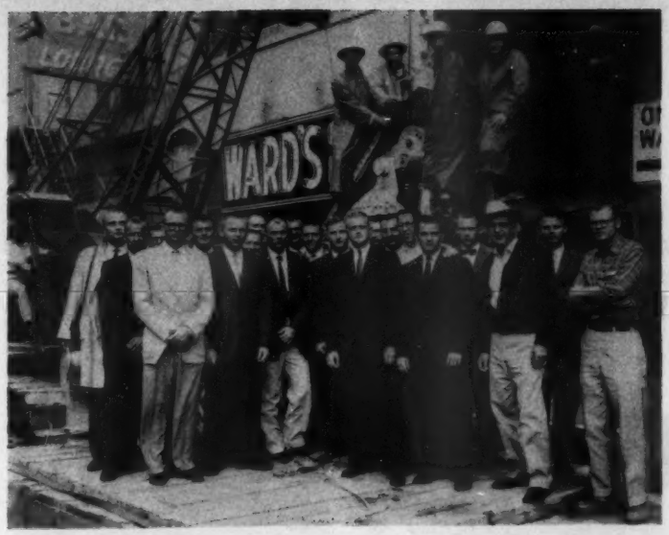
As in the construction course, many of the students work during the summer for contracting firms. In the summer between the sophomore and junior years, the young engineers are required to spend six weeks practicing surveying. About 20 of the civil engineers learn more about construction by participating in the student chapter of AGC.

### What's in the wind

Although the construction course and the combination course were put together to serve the needs of the construction industry, certain educators and contractors feel there is a need for improvement. Construction is a new field for colleges. Exactly what should be taught, and how it should be taught, requires a good deal of study and research.

Men in the construction industry itself must come to an agreement on

*(Continued on page 38)*




Members of the student chapter of AGC—made up of students in the architectural construction and the civil engineering and business administration courses—take a stand for the cameraman near one of the shafts during a visit to a storm-sewer job in Dallas. This job was included in one of the 2-day field trips made semiannually by the group.

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## Exclusive new design of H-30 provides features and performance which are

# unmatched

### by any other 4-wheel-drive tractor-shovel in the 1-yard class

Ever since 1948 when Hough pioneered the 4-wheel drive tractor-shovel the PAYLOADER has been the pacemaker of the industry. This continued leadership has been the result of constant research and development, better engineering and more experience than any other manufacturer.

Typical of PAYLOADER superiority is this smallest 4-wheel drive machine, which incorporates many advanced and exclusive design features unmatched by any unit of its size and type.

**The H-30 is the only unit** of this size and type with boom-arms positioned completely ahead of the operator's compartment for the utmost safety.

**The H-30 is the only unit** of this size and type with a power-shift transmission which *does not* require *stopping* for a range-shift. It is of Hough design and manufacture.

**The H-30 is the only unit** of this size and type with dual brake pedals – giving an "operator's choice" of braking with or without transmission engaged.

**The H-30 is the only unit** of this size and type with a sealed and pressure-controlled hydraulic reservoir with renewable cartridge-type filter and fine-mesh screen.

**The H-30 is the only unit** of this size and type which has a separate oil-cooling radiator – a fan-cooled "oil-to-air" heat exchanger that cools the transmission and torque-converter oil.

**The H-30 is the only unit** of this size and type which has as much built-in accessibility. The dip-stick, filler cap, batteries, connections and other service points can all be reached from ground level.

**The H-30 is the first and only** 4-wheel drive tractor-shovel that has special seals on all bucket and lower loader points to keep grease in, keep dirt out and reduce wear in these pivot locations.

**The H-30 is the only unit** of this size and type that has a single hydraulic bucket ram and a high-leverage linkage with a minimum of working parts. The hydraulic lines feature the maximum use of formed tubing and a minimum of hoses. All these refinements help to cut maintenance costs and increase reliability.

**The H-30 is the only unit** of this size and type available with a complete complement of useful attachments including the exclusive Drott 4-in-1 bucket.

**The H-30 has a greater** horsepower-to-weight ratio than any other unit of this size and type. This provides more useable horsepower for digging, loading and travel operations.

**Four-wheel brakes:** The H-30 has four-wheel brakes that are equally effective in either forward or reverse. They are sealed against dust and dirt.

**The H-30 has many other** big PAYLOADER features including two-phase torque-converter, planetary final drives, power-steer, separate parking brake on drive shaft, rear-axle drive disconnect, 43° bucket tip-back at ground, 8'4" bucket-dumping clearance, full rear-axle oscillation. Bucket sizes range from ¾ to 2 cu. yd. (S.A.E. rated).

Your Hough Distributor who sells the complete PAYLOADER line of proven tractor-shovels has one of the finest service and parts facilities in the business, supplemented by Hough factory service personnel.

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## On-the-job performance of the Model H-120 proves it far more

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### because it has more power, better balance, longer reach and more dumping height than any tractor-shovel in its class

Productive capacity and performance are the true measures of any machine, and the 4¼-yard Model H-120 excels on both counts. Hough's greater experience and "know how" in tractor-shovel engineering was never more apparent than in the design of this big PAYLOADER.

**The Model H-120 has 300 horsepower** – more than any other machine in this category. Maximum tractive and hydraulics demands are handled simultaneously without "lugging down." The H-120 has a higher horsepower-to-weight ratio – as much as 30% more than other machines in its size range – because a lot of useless dead weight has been eliminated.

**The H-120 has more dumping clearance,** and more dumping reach, than comparable units. It loads big trucks and railroad cars more evenly and easier – can stockpile higher.

**The H-120 has better balance and stability** because of the exclusive use of extra-strong "T-1" steel for box section boom arms that saves over a ton of dead weight on the load-carrying end. The approved and exclusive use of dry ballast material in the rear tires lowers the center of gravity with 50% of the weight below the rear axle.

**The H-120 has a separate oil-cooling radiator** that is fan-cooled. This exclusive feature provides effective cooling of the transmission-torque converter oil at all times.

**The H-120 is even easier to drive** than smaller tractor-shovels, say the operators, because of power air-brakes, power-steer, power-shift, and unusual visibility.

**The H-120 has a distinctive boom design,** forward and clear of the operator for greater safety. It features a single bucket-tilting ram and high-leverage linkage with a tremendous break-out force. Another big advantage is simplicity and fewer parts, reducing wear and maintenance.

**The H-120 has a Hough-built full power-shift transmission** of advanced design. It is a full-reversing, constant-mesh type providing 4 gear ratios in each direction. All four gear changes are made with one lever and *without stopping* for a "range" shift.

**The H-120 has "Operators-Choice" brake control** – exclusive in its class. Dual pedals permit the operator to brake with or without the transmission engaged, as desired for any operating situation. The large-capacity 4-wheel air brakes contribute greatly to the easy, safe handling of the machine.

**The H-120 has special protection throughout** to promote long life and reduce maintenance of the engine, drive train and hydraulic systems. A special dry-type, two-step, engine air cleaner gives 99.8% dust-removal efficiency under the most adverse conditions. The hydraulic system is sealed and pressure-controlled to keep out air-borne dirt, and is further protected by an exclusive system of cartridge-type filter and fine mesh screens.

**The H-120 is provided with canopy-type cab,** windshield wipers and special lights as standard equipment. Bucket sizes are available from 3¾ to 8 cu. yd. (S.A.E. rated). The exclusive 4 cu. yd. Drott 4-in-1 bucket can also be supplied.

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C. J. Godwin, in charge of the "construction option" group of students, is no stranger to the practical aspects of the work. He worked for three years as a building construction superintendent. He also has his own private engineering practice in a neighboring city and is a registered architect and registered engineer.

## Asphalt reference work appears in new edition

■ The first volume of a 5-volume sixth edition of "Asphalts and Allied Substances," by Herbert Abraham, has been published by D. Van Nostrand Co.

Titled "Historical Review and Natural Raw Materials," this volume is divided into two general sections. The first gives a brief historical review, along with the terminology, classification, and chemistry of bituminous substances. It also discusses natural raw materials.

The second section deals with the geographic locations of asphalt deposits and outlines methods of mining, transporting, refining, and of storing them. Included in the 370-page book are indexes of subjects, specifications, authors and patentees, a bibliography, and references.

The other four volumes of the sixth edition will deal with industrial raw materials, manufactured products, and methods of testing.

Volume I may be obtained from the D. Van Nostrand Co., Inc., 120 Alexander St., Princeton, N. J., for $10.75.

(*Continued from page 33*)

exactly what knowledge is necessary for a young man entering the field. Professors at the college must figure out how to give him this information. In order to accomplish this purpose, a committee consisting of faculty members in the various departments relating to construction has been appointed at Texas A. and M. The committee will work closely with heads of construction companies in determining the industry's needs.

### Contractor's viewpoint

One company president with whom the committee is working closely is H. B. Zachry, of H. B. Zachry Co., San Antonio. As president of the board of directors of Texas A. and M., Zachry naturally has a strong interest in education. He is a graduate of the college's Department of Civil Engineering.

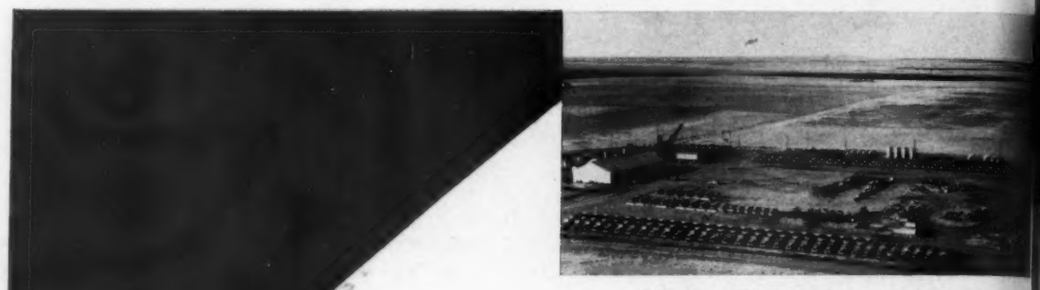
Zachry feels that a curriculum in construction engineering should place more emphasis on keeping track of costs and on business management as applied to a construction company. He believes that a student could do without some of the advanced courses in engineering and mathematics. He questions the practicality of such courses as calculus, advanced surveying, hydraulics, certain design courses, and others.

Regarding qualification of graduates required by the construction industry, a report by his company states:

"The daily duties of a construction engineer are notably lacking in pure engineering. First and foremost, his attention is on production. He is cost conscious: reports to management and reports from foremen concern costs. Production rates, work simplification, better methods, more skilled personnel—these problems command his energies. On top of these are the problems of equipment maintenance and utilization, interest, financing, and labor-law compliance. The ultimate measure of the job is its cost and this cost becomes the major factor in considering the next job.

"The construction industry seems to be demanding more specialized training. This demand is to be seen in the curricula changes of many engineering schools, the addition of extra years and extra degrees. Construction engineering appears to be developing into a profession."

THE END

Multi-million dollar picture. Here is part of Western's equipment lined up for inspection at Oahe Dam. Photo shows 86 trucks, 23 bulldozers and crawler pieces and 9 scrapers.

# 2 ways Standard Oil helps Western Contracting Corporation save on Oahe Dam job

*In eight years on project, 10 million gallons of diesel fuel and gasoline have been delivered on time and when needed*

**Saving No. 1** F. L. "Red" Napple, Standard Oil staff engineer, and Standard Oil agent Bob Friman have been serving Western on the Oahe Dam project since the first dirt was moved in 1952. This means continuity of service that can be invaluable to a contractor. Red Napple has an engineering degree plus more than 13 years' experience in just this kind of work. Western thus has the equivalent of another engineer helping them. Napple is located at Aberdeen and Friman at Pierre, both only a few miles from the job. Western works around the clock. So does Standard. Bob Friman and his men make deliveries 24 hours a day, winter and summer. Western never has equipment down while waiting for deliveries of fuels, lubricants or greases.

**Saving No. 2** Western uses only quality products —Standard's Diesel Fuel, STANDARD RED CROWN

# Manufacturer Memos

Jules C. Laegeler, vice president in charge of engineering, The Frank G. Hough Co.

**Jules C. Laegeler** is the new vice president in charge of engineering for **The Frank G. Hough Co.**, Libertyville, Ill. He has been chief engineer for the company since 1951.

Also appointed were **Keith W. Kampert** as chief engineer, product design; and **Thorvald Granryd** as chief engineer, research and development.

**William F. Martin** has been appointed vice president and assistant general manager of the Mechanics Universal Joint Division of the **Borg Warner Corp.**, Chicago, Ill. For the past year, he has been director of manufacturing services for the parent company.

Martin will assume many of the duties that were previously the responsibility of **Frank W. Rickard.** Rickard, who continues as president of Mechanics, was recently elected a group vice president of Borg-Warner.

**Ridley & Co., Inc.**, Los Angeles, Calif., manufacturers of high-volume concrete guns and gunning rigs, has made **Jack Thomas** sales manager.

He will be located at Ridley headquarters, 2217 Pontius Ave., Los Angeles.

H. J. Allen, vice president of sales for the Buffalo-Springfield Co.

**H. J. Allen** is the new vice president of sales for the **Buffalo-Springfield Co.**, a division of Koehring Co., Springfield, Ohio.

Allen was previously vice president of export sales for the division. In his new position, he will handle all sales functions related to the sale of rollers and drill equipment for the domestic market, and of drilling equipment for the export market.

**W. E. Rexroat** has been named works manager of the division. He was previously with Koehring-Waterous, Koehring's Canadian subsidiary.

Buffalo-Springfield manufactures compaction equipment and water, oil, and blast-hole drills.

Frank J. Nunlist, vice president of operations for Worthington Corp.

New vice president of operations for **Worthington Corp.**, Harrison, N. J., is **Frank J. Nunlist.**

He will supervise the activities of the company's 16 domestic operating divisions in 10 states, as well as regional engineering and service activities. Since 1958, Nunlist has been a group vice president at Worthington, manufacturer of pumps, compressors, and other construction machinery.

**Charles E. Nelson, Jr.**, has been elected president of the **Waukesha Motor Co.**, Waukesha, Wis. He succeeds **James E. DeLong**, retired.

Nelson joined Waukesha in 1929. Since 1957, he has been executive vice president of the company.

Also elected were **J. G. Swain**, vice president, and **L. W. Youker**, secretary and treasurer. **N. H. Willis** was appointed vice president of engineering, and **J. J. Kleinbrook**, assistant secretary and assistant treasurer.

Waukesha manufactures heavy-duty industrial combustion engines.

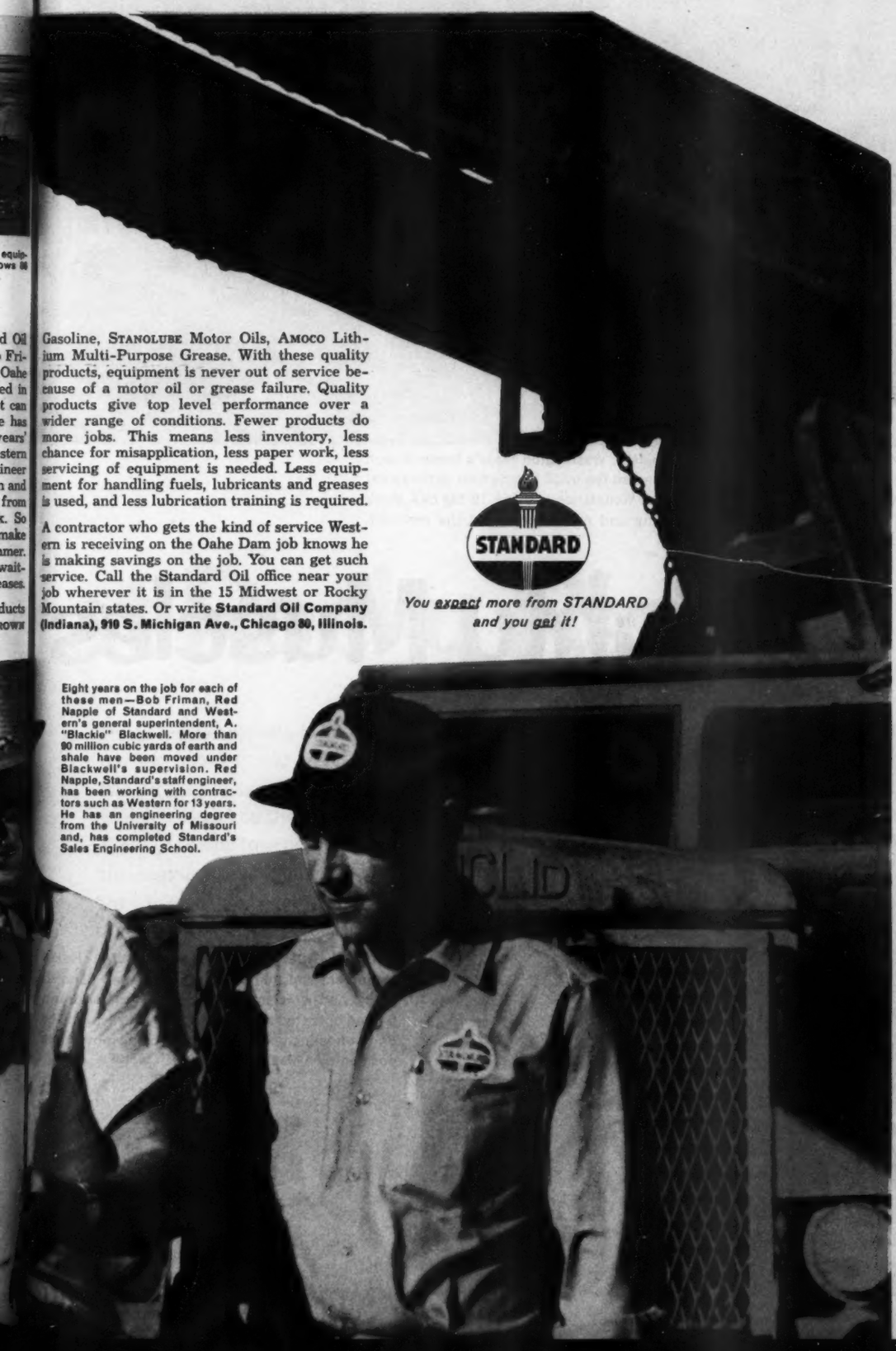
**The Jaeger Machine Co.**, Columbus, Ohio, has elected **Andrew C. Thomas** vice president in charge of new-product development.

For the past five years, Thomas has been assistant general sales manager for the company, which manufactures truck mixers, concrete mixers, compressors, contractors' pumps, and paving machinery.

Assistant general sales manager for **The Lincoln Electric Co.**, Cleveland, Ohio, is **A. F. Boucher.**

Boucher was formerly Lincoln's Detroit district manager. He joined the company in 1936.

◀ For more facts, use Request Card at page 18 and circle No. 274


Gasoline, STANOLUBE Motor Oils, AMOCO Lithium Multi-Purpose Grease. With these quality products, equipment is never out of service because of a motor oil or grease failure. Quality products give top level performance over a wider range of conditions. Fewer products do more jobs. This means less inventory, less chance for misapplication, less paper work, less servicing of equipment is needed. Less equipment for handling fuels, lubricants and greases is used, and less lubrication training is required.

A contractor who gets the kind of service Western is receiving on the Oahe Dam job knows he is making savings on the job. You can get such service. Call the Standard Oil office near your job wherever it is in the 15 Midwest or Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago 80, Illinois.**

*You expect more from STANDARD and you get it!*

Eight years on the job for each of these men—Bob Friman, Red Napple of Standard and Western's general superintendent, A. "Blackie" Blackwell. More than 90 million cubic yards of earth and shale have been moved under Blackwell's supervision. Red Napple, Standard's staff engineer, has been working with contractors such as Western for 13 years. He has an engineering degree from the University of Missouri and, has completed Standard's Sales Engineering School.

**MACK LVX DUMPERS RIPRAP A RISING RIVER.** When complete, Washington State's Rocky Reach Dam will raise a pool in the Columbia River that would have periled the track foundations of the Great Northern Railroad. To prevent this, Goodfellow Bros., Inc., of Wenatchee is using 15 big LVX Mack dumpers to move over a million tons of rock for riprapping and reinforcement of the roadbed.

# Mighty Muscles a

**CAISSON ROLLING—THE MACK WAY.** Heavy equipment and material for the dam was handled easily and efficiently by this big tractor-drawn flatbed operated by Rocky Reach Contractors. The 64-ton floating caisson section is being moved into position by a Mack B-73 tractor.

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Photo credit to Stone & Webster Engineering Corporation, Rocky Reach project engineers.

# at Rocky Reach

MACK
for over 7 straight years
NO. 1
by far in sales of
diesel trucks

In the harnessing of a big river, trucks supply the big moving muscles, and the Rocky Reach Hydro-Electric Project being built by Chelan County Public Utility District on the Columbia River at Wenatchee, Wash., is made to order for brawny Macks. Handling the heaviest jobs known to big-league construction, they have hauled everything from riprap to caissons. And everywhere they've worked, they've set the pace for reliability, stamina and economy of operation.

Dumpers, concrete mixers, tractors, flat-bed trucks —there are dependable, economical Macks for every construction job . . . right up to the biggest. Moreover, when you standardize on Macks, you gain the added savings of a completely integrated parts and upkeep operation. Mack controls the quality of every Mack part because it makes more of its own major components—engines, clutches, brakes, transmissions, bogies, cabs, etc.—than any other maker. And every Mack is "Built like a Mack"... made to outlast, outwork, outearn anything else on demanding jobs.

Why not join the swing to Macks—the swing that means maximum hauling efficiency at minimum unit costs. Contact your Mack branch or distributor for full details and specifications. Mack Trucks, Inc., Plainfield, New Jersey. Mack Trucks of Canada, Ltd., Toronto, Ontario. 7800

**MACK** FIRST NAME FOR **TRUCKS**

A dope crew of Panama-Williams Corp. of Houston—one of several contractors working on lines for two gas companies—is using CRC pipe-laying equipment, pulled by an Allis-Chalmers tractor, for a 59-mile 6 and 8-inch lateral near Wausau, Wis. This line is for Michigan Wisconsin Pipe Line Co.

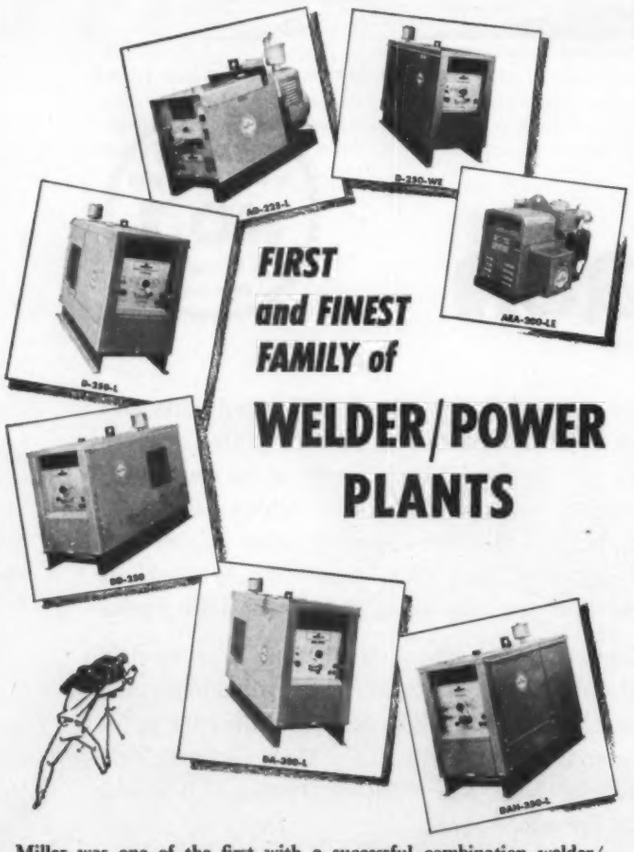
The HD-11 backfiller follows close behind the dope crew on Panama, Inc.'s section of 24-inch main line, built for Midwestern between Marshfield, Wis., and the Chippewa River.

***Differences in terrain require individual methods of contractors handling***

## Tough work on 893 miles of gas line

Pipeline contractors working on 893 miles of gas line in Minnesota and Wisconsin, through which the upper Midwest will be supplied with its first Canadian natural gas, had a variety of problems to overcome on their separate spreads. Some 15 river crossings had to be constructed, blasting had to be done in several tough areas, and land clearing for one spread had to be handled with some special equipment.

The $70 million project includes approximately 504 miles of main 24-inch line and 54 miles of laterals for Midwestern Gas Transmission Co., a sub-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Miller was one of the first with a successful combination welder/power plant. This established a lead never lost notwithstanding the most widespread efforts at copying and duplication. Shown here are gas and diesel engine driven welders in d-c and a-c/d-c models.

In this group there is a welder/power plant size, type and price to meet every practical need — all available with field-tested accessories and trailers.

Complete specifications will be sent promptly upon request. Please indicate model or models.

miller ELECTRIC MANUFACTURING CO., APPLETON, WISCONSIN
Distributed in Canada by Canadian Liquid Air Co., Ltd., Montreal

For more facts, use Request Card at page 18 and circle No. 276

LOADING POWER means production power!

Production power means time and money saved. Rockford Spring Loaded Clutches are the perfect, controlled power-link between engine and work. These heavy duty clutches are used on many loaders, graders, and off-the-road trucks. Next time specify Rockford. Many sizes and types of clutches and power take-offs are available. Write today for complete details.

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For more facts, use Request Card at page 18 and circle No. 277

A Cleveland trencher owned by Panama, Inc., makes good progress through a clay-sand mixture on Midwestern's 24-inch main line. Crawler tractors were used to rip the line ahead of the trenchers.

Five side-boom tractors are preparing to lower a 160-foot length of weighted pipe into the Black River near Willard, Wis. The operation, using three HD-21's and two HD-16's, climaxed 12 days of work on the trench by Panama.

sidiary of Tennessee Gas Transmission Co. of Houston, plus 92 miles of main 24-inch line and 243 miles of laterals for Michigan Wisconsin Pipe Line Co., a subsidiary of the American Natural Gas Co.

Midwestern's main line begins at the Canadian border near Emerson, Manitoba, at a connection with a 30-inch spur line recently built by Trans-Canada Pipe Lines, Ltd. It runs southeast through Minnesota, enters Wisconsin near St. Croix Falls, and continues to Marshfield, where it connects with Michigan Wisconsin's main line.

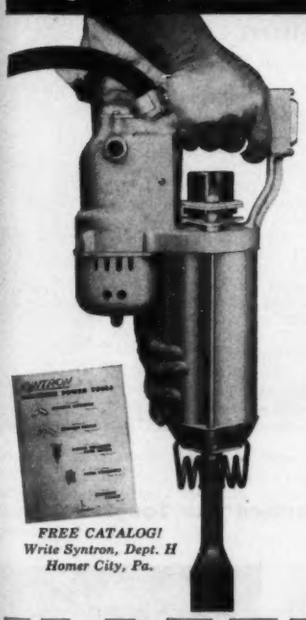
Midwestern's entire pipe route runs through gently rolling glaciated country and is dotted with various-size stands of timber, much of which is second and third growth, with considerable brush. Brush-clearing tractors with shearing blades worked well on this job. One of the contractors, Panama, Inc., Houston, used an Allis-Chalmers HD-16 with a cable-controlled angle blade and stinger. The unit took a 1,500-foot stretch at a time, clearing the 75-foot right-of-way in about 7 passes. It averaged about a mile per day.

Timber measuring more than 4 inches in diameter was cut into pulp-

(*Continued on next page*)

Loading 24-inch pipe onto pipe-stringing trucks for Panama, Inc., is a Bucyrus-Erie 15-B crane. Pipe lengths averaged about 59 feet.


SYNTRON ELECTRIC



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Chip, channel, drill, cut, scale —your SYNTRON Hammer delivers 3,600 blows a minute *continuously* without breakdown!

Depend on Syntron for more speed, more power, lifelong low maintenance, too!

**SEE THEM IN ACTION!**
**SYNTRON ELECTRIC HAMMERS**

**Available in 3/8" to 2" capacities.**

**The Syntron Sales Representative in your area will gladly arrange an on-the-job demonstration. Phone them for fast action!**



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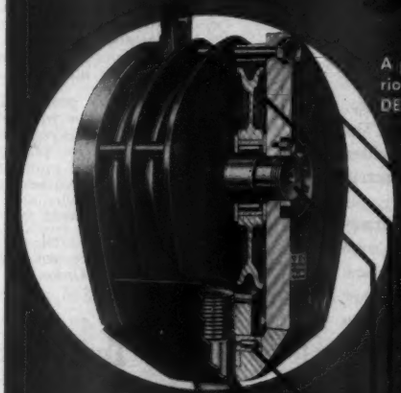
inside story



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For more facts, use Request Card at page 18 and circle No. 279

Working on Michigan Wisconsin's 16-inch lateral near Royalton, Wis., is the dope crew of Harbert Construction Corp., Birmingham, Ala. Crews cleaned, doped, and "mummy-wrapped" pipe in a single operation.

Harbert's welders complete a tie-in at a road crossing on Michigan Wisconsin's longest major lateral. The 85½-mile line runs through areas that made land clearing and rock shooting some of the most difficult parts of the job.

(*Continued from preceding page*)

wood lengths by the chain-saw crews that followed and was stacked along the right-of-way for the landowners. Two tractor-dozers worked behind them, grubbing out stumps and pushing slash into the center of the "aisle" for burning.

Several contractors on Midwestern's line ran into sizable quantities of rock on their loops. Houston Contracting Co.'s trenching crews encountered heavy outcroppings of trap rock in the vicinity of the St. Croix River. Most of it had to be shot, and the trench was cleaned out with backhoes and clams.

Panama ran into huge granite boulders in the bed of the Black River near Willard, Wis. It took crews 12 days to complete an 8-foot-deep trench across the 120-foot-wide stream. About ten cases of 40 per cent Atlas dynamite were used in one 15-foot stretch alone. Five Allis-Chalmers side-boom tractors were trucked back 10 miles from the dope and tie-in crews to place the 160-foot section of pipe in the shallow river. The 90,000-pound length was weighted with eleven 5,000-pound concrete river weights.

All but three of the 15 river crossings on Midwestern's main line were handled by the pipeline contractors, since the streams were shallow enough to be waded by side-boom tractors. Crossings of the larger streams—the Mississippi, the St. Croix, and Chippewa rivers—were handled by firms specializing in this type of work.

#### Rip ahead of trenchers

Much of the soil along the pipeline route is a clay-sand mixture, and most of Midwestern's contractors used crawler tractors to rip ahead of the trenchers to speed the work. This allowed maximum ditching engine power to go to the wheel and reduced maintenance on the units.

Panama's ditching crews averaged about 7,000 feet per day. To keep ahead of the dope gang, ditching and clearing crews worked 7 days a week. The rest of the spread worked 6 days a week, usually from 10 to 14 hours per day.

The cool, dry weather during the


UNION

## The *S. O. S. Wire Rope Organization

**Service on Schedule*

Delayed action on distress signals for wire rope can set up a chain reaction of downtime losses.

With hundreds of selected distributors surrounding a hard core of 15 strategically located and expertly staffed branch offices and warehouses Union is uniquely organized for quick rescue service.

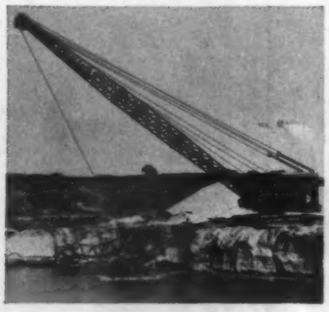
Give this same organization the opportunity and it will help cut down the need to send distress signals. How? Through Union's free preventive service. It guides you in the application of the right wire rope. It uncovers faults in equipment and abuses in wire rope operation which cause excessive wear and overloading.

Customers tell us that Union's preventive service, coupled with quality so good it makes Union the ultimate low cost rope, is helping substantially to battle against rising operating costs. Here's how customers have benefited in other ways from Union's years of preventive service.

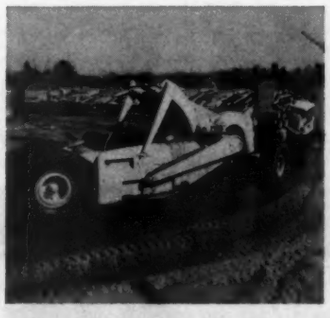
Union engineers sometimes found it impossible to select exactly the right rope from 1600 standard constructions in day to day production. To correct these situations Union laboratory researchers and engineers developed the Tuffy family of special purpose wire ropes and slings. Tuffys are engineered for equipment which imposes extraordinary tough jobs upon wire rope. Each Tuffy is a special construction but in all of them is a balance of strength, toughness and flexibility tailored for longer service life.

Tens of thousands of applications have proved Tuffys to be the ultimate low cost wire rope or slings.

**Tuffy Wire Ropes and Slings are "Job Prescribed" for Tough Jobs**



**Tuffy Balanced Dragline Rope**



**Tuffy Balanced Scraper Rope**

**Tuffy Balanced Dozer Rope**

first two months of operations aided contractors in laying 9,000 to 11,000 feet of pipe per day. All pipe was internally coated. H. C. Price Co., Bartlesville, Okla., double-jointed 150 miles of pipe on the northern end of Midwestern's main line.

Because of extremely rocky conditions in many areas, 5/16-inch rock shield was used, and the line was padded with 8 to 16 inches of sand before final backfilling was done. Specifications called for 3 feet of cover.

### Michigan Wisconsin's line

Michigan Wisconsin's $18 million pipeline serving 32 new communities has a main line that runs in Wisconsin from Appleton west to Marshfield, where it ties with Midwestern's main line. Two major laterals are being built. The longest, built by Harbert Construction Corp., Birmingham, Ala., is an 85½-mile 16-inch line from near Weyauwega northeast to Marinette on the Wisconsin state line. It will serve eight communities along its route. A 59-mile 8 and 6-inch lateral, from near Stevens Point north to Merrill and then east to Antigo, is being constructed by Panama-Williams Corp. of Houston.

For brush clearing on the Marinette lateral, Harbert experimented with a large V-blade mounted on an HD-21. The rig worked well, averaging 15,000 feet per day early in its trial period. But extremely rocky conditions farther north made it necessary to replace the V-blade with a beefed-up angledozer. Harbert also had to shoot considerable quantities of bench limestone a few feet below ground between the Embarrass and Wolf rivers.

Pipe is cradled by an HD-16 side-boom tractor while skids are placed in position at a road crossing on Michigan Wisconsin's main line. This spread, owned by Houston Contracting Co., Houston, worked the 92-mile loop from Appleton to Marshfield, Wis.

Panama-Williams ran into rock near Wausau. It was shot and cleaned out with a Bucyrus-Erie backhoe after the ditch line was stripped and drilled. Some of the dynamiting was eliminated, however, by using an HD-21 to rip the line ahead of the ditcher.

The company also ran into large areas of swamp. In one 15-mile stretch west of Antigo, most supplies and equipment had to be towed into the swamp on skids. Each night, crawler tractors towed the dope kettles out to the nearest gravel road so that they could be loaded, "cooked," and ready to go the next morning. Much of the right-of-way along the ditch had to be riprapped. Even then, the HD-11 cradling tractors went down over their bumpers, and the engine on the rear of the dope wagon powering a centrifugal pump was dragging in the muck. In spite of these difficulties, the entire 15-mile length of 6-inch lateral was laid at the rate of about 1½ miles per day.

For the most part along Michigan Wisconsin's main line and lateral routes, gravel town roads crisscrossed the right-of-way at intervals, usually not more than two miles apart. They provided good access for pipe-hauling, repair, fuel, and welding trucks.

All contractors on the Michigan Wisconsin line cleaned, coated, and wrapped the pipe in one operation before the lowering in. Pipe was cleaned with two sets of wire brushes of four rows each; then a paraffin-base petroleum dope was sprayed on, a corrosion-preventing plastic wrapping applied, and a final layer of coated kraft paper added to the line.

THE END

## Allis-Chalmers news

■ Allis-Chalmers Mfg. Co., Milwaukee, Wis., has consolidated the West Allis centrifugal-pump and compressor departments under the management of E. F. Greiwe.

Greiwe, previously manager of the centrifugal-pump department of the company's Norwood (Ohio) Works, is succeeded there by R. J. Dineen.

The manager of the sales in the new department is C. F. Codrington.

H. L. Ross, manager of engineering, was formerly manager of the West Allis centrifugal-pump department.

Helicopters, long noted for their disaster missions, are becoming "work horses" in the air. Equipped with wire rope and slings they pick up and set materials and machinery down in inaccessible places and carry hurry up loads to otherwise easy to get to places. Photo courtesy Bell Helicopter Corporation, Ft. Worth, Texas.

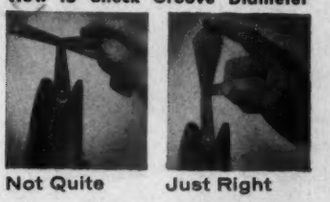
**For the Right Wire Rope and Service-On-Schedule: Call Your Union Distributor**

You'll find him listed in the Yellow Pages — ready with the top-quality Union Wire Rope products you need, and advice on any wire rope problem. Union Wire Rope Corporation, 2260 Manchester Ave., Kansas City 26, Mo.

**Tuffy. Wire Rope Tips**

**Money-Saving Ideas on the Use and Care of Wire Rope**

**How to Check Groove Diameter**



Not Quite — Just Right

Groove diameter of a sheave or drum must never be less than the actual calipered diameter of the new rope. When a new rope is installed on old equipment, use a reliable groove gauge to make sure the tread or bearing surface of all sheaves is of sufficient size to avoid pinching the rope.

**Recommended Sizes**

| Diameter of Rope | Min. Dia. | Max. Dia. |
|---|---|---|
| ¼-⅞ | + 1/64" | + 1/32" |
| ⅞-¾ | + 1/32" | + 1/16" |
| ⅞-1⅛ | + 3/64" | + 3/32" |
| 1⅛-1⅝ | + 1/16" | + 1/8" |
| 1⅝-2¼ | + 3/32" | + 1/16" |
| 2⅜ and larger | + 1/8" | + 1/4" |

New ropes are usually oversize. It is advisable to have groove diameters of sheaves or drums as large as the actual calipered diameter of the new rope, or slightly larger.

**Use the Right Fittings**

Right fittings add life expectancy to wire rope. Fittings which derive holding power from crimping action are harmful. Shown here is a clamp that has no "wrong side"—can be put on either way. It snugly saddles the rope, grips larger surfaces in such a way that loads are carried almost entirely by friction instead of crimping action. Combined in its two parts is a thimble. The parts are interlocked to prevent collapse of the thimble, and eliminate all shear on the bolts.

Would you like a copy of a booklet in which more than a score of Tuffy Tips like those above are reproduced. If so, write Union Wire Rope Corporation, 2260 Manchester Ave., Kansas City 26, Missouri.

**Balanced gs and t Lines**

UNION Wire Rope

Subsidiary of ARMCO STEEL CORPORATION

OTHER SUBSIDIARIES AND DIVISIONS: Armco Division • Sheffield Division • The National Supply Company Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Southwest Steel Products

4-C

For more facts, use Request Card at page 18 and circle No. 250

# Men and wheels: A lesson in safety

During a recent year, 121 workmen were killed and 2,342 were injured in motor-vehicle accidents on construction projects under the jurisdiction of a U. S. government agency. Of those accidents involving moving trucks (a substantial percentage of the whole), 28 per cent resulted in injuries to men riding on the trucks.

Our concern here is with the latter group of accidents—those causing fractured legs, sprained ankles, concussions, or fatal crushing injuries to workmen riding as passengers on some part of the truck. Most of these accidents occurred while a few workers were being transported from one site to another.

The following descriptions of actual cases will give some idea of the hazards involved in careless transportation of workers:

1. The claimant was riding with his legs over the tail gate of a pickup truck. He was thrown out when the vehicle collided with another truck.

2. While riding on the running board of a batch truck, a worker was caught between the front of the dump body and the legs of a batch plant.

3. As a result of jumping from a moving vehicle, the claimant fractured his ankle.

4. The claimant slipped on the running board of a pickup truck and strained his back.

5. The rider, seated on the rear of a pickup truck, was thrown off when the vehicle hit a bump in the road.

6. The driver and passenger of a truck were badly shaken up when the vehicle was driven off the road and into a field to avoid collision with a train at a temporary crossing.

7. A carpenter was thrown to the floor of a dump body when the truck made a sudden stop.

8. While climbing down from a loaded truck, an employee slipped and fell to the ground.

9. When the worker stepped out on the running board of a moving truck, the running board broke and the man fell to the ground. The rear wheels rubbed along the length of his body, just missing crushing him.

### Where he rides is key

The occasional short-distance rider is more often involved in this type of accident than the worker for whom transportation has been properly planned. And the outstanding factor in accidents to riders is their unsafe position on trucks.

If he is to ride only a few hundred feet, a man will often hop on the running board where a sudden jounce will throw him; sit on the rear or sides with his legs dangling, which exposes him to injury by crushing; stand up in the body where a sudden stop will cause him to fall or low-hanging branches may catch him unawares; ride with a load that may shift and pin him; ride on the load where he can be pitched off at sharp curves, rough places, and by sudden stops; or ride in a number of equally dangerous places.

One preventive method that has been used with some degree of success is for the contractor to provide written notice to the drivers of all vehicles that only those authorized to ride will do so, and then only in the cab.

Very often it is necessary for a couple of men to ride in a truck to help with loading operations. These helpers should ride in the cab with the driver. If there is not room in the cab, if the trip is short, and if the body is empty, the men may ride seated on the floor of the body with their backs to the cab. After the truck has been loaded—and if the load occupies all of the body or is high, loose, or likely to shift—other provisions must be made for the men.

When it becomes necessary to frequently shift groups of men from one location on a job site to another, special provision must be made for their safety en route. If a truck must be used, a stake truck specially outfitted is the best type for this purpose.

Three important items should be stressed with regard to modifying the body of a stake truck:

1. Side and rear stakes should be in good condition and tight enough in their sockets to prevent excess motion. They should be at least 42 inches high.

2. Bench-type seats running the length of the body should be fastened securely to the floor.

3. One section of the rear should be removable and sufficiently strong to serve as a ladder. A better means for dismounting is a portable ladder with metal handholds, carried in the truck.

If a dump truck is used to transport personnel, the body must be secured to the chassis with a body lock. If a pickup truck must be used, the rear must be blocked off by a chain, cable, or strap to a height of at least 42 inches above the bed. Hinged seats are also recommended for this type of truck.

**Problem:** *Right-of-way must pass stream at 45° angle, instead of norm 90°. Situation further complicated because stream flows downhill at 8 mp*

**Outlasts the highway!**

Tax dollars go further when you specify Wheeling Corrugated Metal Culvert Pipe for highway drainage. That's because Wheeling Culvert Pipe costs *less* to buy . . . *less* to install . . . and *less* to maintain! Here's why:

**Can't disjoint**—Wheeling Culvert Pipe comes in long lengths, so joints are few. What's more, they can't open because pipe has beam strength . . . and Wheeling Culvert Connecting Bands grip *both* pipe ends securely.

**Flexible strength** — Unlike rigid pipe, corrugated metal culvert pipe is flexible. So it easily absorbs shock and

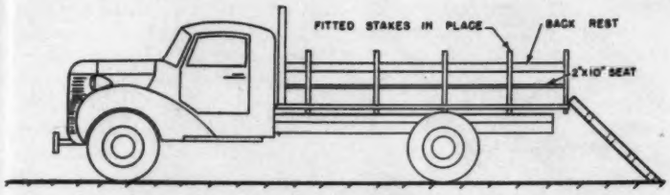
extreme vibratio caused by shiftin fill and heavy truck Equally importan this flexibility en ables Wheeling Cu vert Pipe to "borrow strength from sur rounding fill (see f yourself — try this simple test wi your garden hose).

**Choice of end treatments**—Special en treatments (including skews and be els) can be quickly, economically sup plied by your Wheeling Culvert Plan

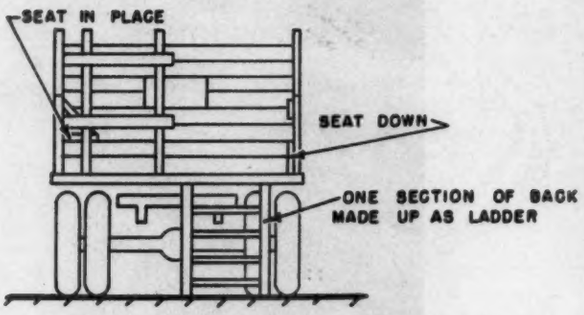
**WHEELING CORRUGATING COMPA**

Warehouses: *Boston, Buffalo, Chicago, Columbus, Detroit, Kansas City, Louisville, Minneap*

ROY WOODWORTH • Liberty Mutual Insurance Co. • Boston, Mass.




This side view of a stake truck shows seats running along the sides of the body for safe transportation of workers.




Rear view shows seats are hinged for folding out of the way; a section of the back serves as a ladder.

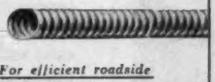
**Solution:** *Wheeling Metal Culvert Pipe with skewed and beveled ends. This allows the pipe structure to be designed with the stream flow . . . permits the ends of the pipe to conform to the contour of the slope, thus improving efficiency and appearance.*

Get the full story on Wheeling Corrugated Metal Culvert Pipe and Fittings (both copper steel and copper-bearing pure iron) from your Wheeling man. Wheeling Corrugating Company, Wheeling, W. Va.

**You always get fast delivery** on Wheeling Culvert Pipe and Fittings because Wheeling maintains special culvert plants at Des Moines, Detroit, Kansas City, Louisville, Madison, Wis., Martins Ferry, Ohio, Minneapolis, Peoria, Philadelphia, St. Louis.

USE WHEELING CULVERT PIPE HERE, TOO!

*Where headroom is limited, use special wide-based Wheeling Pipe Arch.*



*For efficient roadside drainage, use Wheeling Small Diameter Culvert Pipe.*

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**Getting on and off**

The act of getting on and off trucks accounts for many injuries resulting in lost work time, not to mention pain and possible permanent disability. The most frequent disabilities are strains and sprains—wrenched backs, knees, or ankles. The most serious accidents happen when men jump on or off moving vehicles. The great risk is that the worker will be run over by the wheels.

Drivers have started their trucks without warning and without making sure the men were on and seated properly. The riders, on the other hand, have failed to wait until the truck stopped before attempting to alight, and in their haste to get off they have often crowded or pushed a fellow worker. Horseplay is sometimes a factor in this type of accident.

Wet and uneven ground and muddy shoes are factors that increase hazards in getting on and off vehicles.

Good driving is essential to insure the safety of riders. In traveling rough roads, the driver should drive slowly and avoid the worst ruts. Proper care of haul roads can reduce this hazard.

Proper handholds and steps should be provided for and used by the riders, and this equipment should be inspected regularly.

In conclusion, three conditions should receive prime attention in transporting workers:

1. Proper seating and other facilities for workers being transported.

2. Wider, straighter, and smoother roadways, properly maintained.

3. Safeguards at ditches, bridge approaches, sides of vehicles, buildings, etc.

Four practices should be recommended to all those involved in transporting workers:

1. Proper reduction of speed at night, on rough roadways and ground, at intersections, and in congested areas.

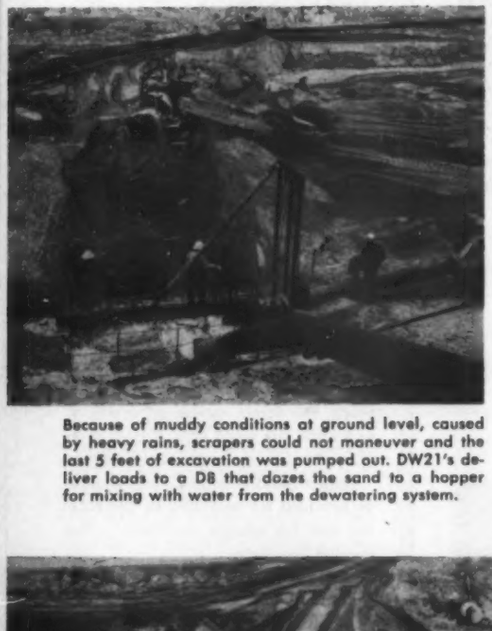
2. Discouragement of unauthorized riding and of riding on loads, fenders, running boards, sides of vehicles, etc.

3. Caution against jumping on and off moving and even standing vehicles.

4. Informing employees about the hazards of wet and slippery conditions in driving, getting on and off, and working on trucks and other vehicles.

THE END

Concrete placement is in progress for the Old River Lock, part of the $80 million Old River Control Project that is designed to keep the Mississippi on its course instead of flowing through the Atchafalaya River to the Gulf. The Mississippi is in the background; the Old River is at upper left. Conditions required an unusual method of excavating the last 5 feet for the lock.



Because of muddy conditions at ground level, caused by heavy rains, scrapers could not maneuver and the last 5 feet of excavation was pumped out. DW21's deliver loads to a D8 that dozes the sand to a hopper for mixing with water from the dewatering system.

***Contractor on excavation of Old River Lock demonstrates***

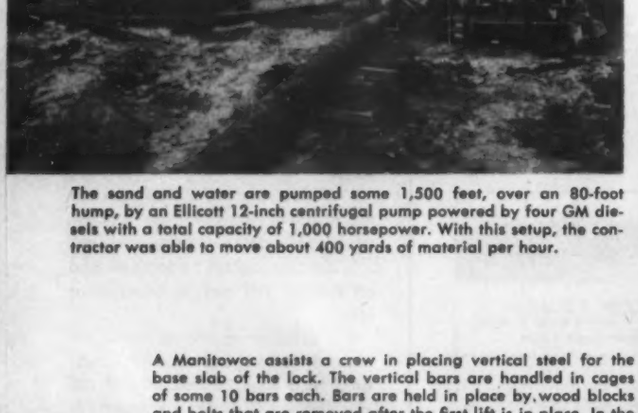
# How to pump sand out of a dry hole

by BILL ALLEN, field editor

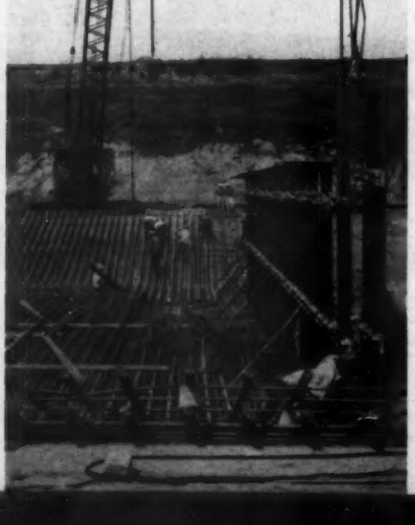
Pumping sand out of a dry hole sounds impossible. But this unusual method of excavation kept the work on schedule during the construction of the Old River Lock some 50 miles north of Baton Rouge, La.

Here's the picture. Brown & Root, Inc., Houston, Texas, faced the problem of taking out the last 5 feet of the lock excavation. The hole was down about 75 feet. It was kept dry by a deep-well dewatering system. Scrapers could load the sandy material at the bottom of the hole, but they could not maneuver in the mud that surrounded the top of the hole. The winter rains had made a quagmire of the silty soils at ground level.

To get around the problem, the contractor devised a pump for lifting the material out of the excavation. The sand was mixed with water from the discharge of the dewatering system. Scrapers loaded the material and dropped it alongside the hopper where the sand and water were mixed. A dozer pushed the material into the mixing hopper.



The sand and water are pumped some 1,500 feet, over an 80-foot hump, by an Ellicott 12-inch centrifugal pump powered by four GM diesels with a total capacity of 1,000 horsepower. With this setup, the contractor was able to move about 400 yards of material per hour.



A Manitowoc assists a crew in placing vertical steel for the base slab of the lock. The vertical bars are handled in cages of some 10 bars each. Bars are held in place by wood blocks and bolts that are removed after the first lift is in place. In the foreground are 2¼-inch-diameter steel bars, the largest used.

### Sand, water mixed in hopper

The material passed through a grate into the 10 × 15 × 8-foot-deep steel hopper. Water, at the rate of about 3,000 gpm, was discharged into the hopper from the deep-well dewatering system. A gooseneck from a 12-inch line dipped into the hopper to suck out the mixture of sand and water. To control the amount of solids in the line, the height of the mouth of the pipe above the bottom of the hopper was adjusted by means of a winch and cable arrangement.

Located just a pipe length away from the mixing hopper was the Ellicott 12-inch centrifugal pump that boosted the sand and water over an 80-foot hump and through about 1,500 feet of discharge line. The pump was powered by four GM diesels with a combined horsepower of 1,000. Using this setup, the contractor was able to move about 400 cubic yards of material per hour.

### Old River Control Project

Although a sizable project in itself, the building of the navigation lock is a small part of a tremendous construction program to control the flow of the Mississippi River. The $80 million Old River Control Project is designed to keep the Mississippi flowing in its present bed in lower Louisiana. The control structures will prevent the mighty river from seeking a short cut to the Gulf by way of the Atchafalaya River.

Water from the Mississippi will still flow into the Atchafalaya, but the flow will be controlled by concrete structures and a man-made channel connecting the two rivers. The Old River, the only natural link between the Mississippi and the Atchafalaya, will be dammed. A navigation lock beside the dam will allow boat traffic to pass from one river to the other. (For details on earlier phases of construction, see C&E articles: "Concrete Operations Move Swiftly on Old River Control Structures," August, 1957, page 34; "Excavation, Clearing Prepare for Old River Control Project," October, 1956, page 30; and "Old Man River Will Roll Along with Help from Corps of Engineers," October, 1955, page 100.)

Work on the over-all project, which started in 1955, is now about 34 per cent completed. The construction of the low-sill and overbank structures is virtually finished, while the dredging of the outflow channel is over 90 per cent completed.

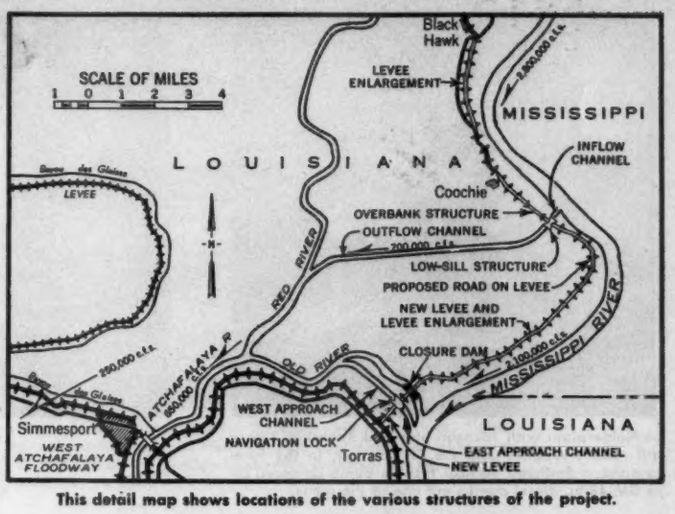
At Old River, concrete placement for the lock is well along. The structure is expected to be completed by the spring of 1962. In the following year, work will start on the hydraulic fill structure that will dam Old River. The entire project is being carried out by the Mississippi River Commission, with the New Orleans District of the U. S. Army Corps of Engineers in direct charge.

Unlike most locks, the Old River structure rests on a natural sand bed. There are no supporting piles. The 1,200 × 75-foot lock is designed for lifts up to 37 feet, although the lift generally will be several feet. The U-shaped reinforced-concrete structure has 78-foot-high walls and a base slab of 12½-foot normal thickness.

Excavation for the lock began in July of 1958. Atlas Construction Co., Vidalia, La., tackled the 1.8-million-yard job with a variety of equipment.

Early stages of the excavation were handled with draglines loading into bottom-dumps. These units hauled the silty soil to build a perimeter cofferdam that was a safeguard against maximum river stages. The haul units

(*Continued on next page*)




This detail map shows locations of the various structures of the project.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A Noble plant with Johnson bins and Koehring 2-yard tilt mixers supplies concrete for the job. In the foreground, a Redhead vertical turbine pump powered by a GM 48-hp diesel pumps out one of the wells.

Located near the plant are stockpiles of two sizes of aggregate and sand maintained by separate conveyors. Materials drop to a recovery tunnel that feeds the inclined conveyor leading to the Johnson bins of the plant. Aggregates and sand are trucked about 70 miles to the site.

(*Continued from preceding page*)

were assisted by two big walking draglines. These 200W Monighans cast and rehandled the soil to move it from the lock excavation.

An 18-inch cutterhead dredge moved onto the job to chew out the lower stages of the excavation. Moving a total of about one million yards, the dredge cut the excavation to within 5 feet of final grade.

### Deep-well dewatering

It was at this stage that Brown & Root took over the job on its $14.7 million contract to complete the lock. One of its first moves was to put in an extensive dewatering system. This consisted of 37 deep wells, spaced equally around the perimeter of the excavation. The wells, approximately 150 feet deep, are designed to hold the water table down to 5 feet below the level of the chamber excavation. Each of the wells consists of a 30-inch drilled shaft containing a 12-inch wooden screen surrounded by a well-graded filter gravel.

The water in each well is propelled to the surface by a Redhead vertical-lift turbine pump driven by a GM 48-hp diesel engine. The discharge from a group of about 8 wells is piped to a header line that carries the water over the earth cofferdam into the river. The combined capacity of all the wells is in excess of 37,000 gallons per minute.

The contractor devised a time-saving method to fuel the pump engines. Four 8,000-gallon fuel tanks were positioned at the upper rim of the excavation—two on one side of the hole and two on the other. Pipes from these storage tanks led down to the individual 500-gallon tanks beside each pump. The filling of individual tanks was simply a matter of opening a valve and letting gravity do the rest.

With the excavation pumped out and the dewatering system in operation, work started on the excavation of the final 5 feet under the chamber and the 13-foot excavation under the gate bays. The material was moved with Caterpillar DW21 scrapers unloading near the water-filled hopper. The material was dozed into the hopper and then pumped out of the ex-

# WORLD'S BIGGEST BACKHOE!

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Above, the 900 Series backhoe is shown digging a 6-mile section of aqueduct, measuring 12-ft. deep, 9½-ft. wide at bottom, and 25 ft. across the top. On this big cut, the 900 Series AMERICAN trenched up to 460 lineal feet per 8-hour day . . . an average of more than 425 yards hourly!

Owners Young & Anderson, of Brea, California, report that the machine "handled beautifully" on this job, which required laying 87-inch pipe alongside two existing lines. It was one of *five* AMERICANS used on this project.

Whether your line of work calls for 4½-yard backhoes — or capacities down to ½ yard — you'll find AMERICAN offers you operating advantages no other backhoe on the market can match.

Example: Ask about AMERICAN's exclusive *positive-pressure* digging action that gives you 50 to 300% more down pressure at the dipper teeth . . . cuts through the hardest materials . . . gives you heaped dippers on every pass, even at maximum-depth digging. Your AMERICAN distributor will be glad to give you the full story. B-703

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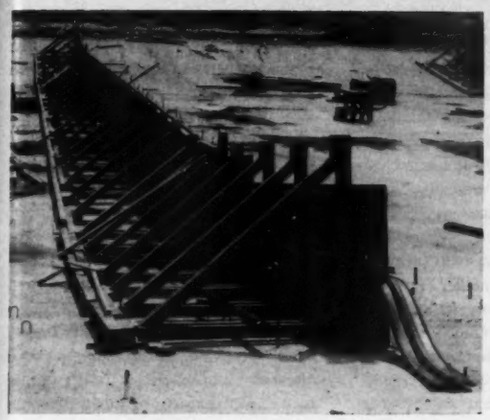


Economy steel panels, positioned and braced, are being used to form the first lift of the 12½-foot base slab. Rubber waterstops, such as the one at right foreground, prevent leakage at all construction joints.

Two Manitowoc cranes place steel for the base slab of the lock. In the foreground is the steel for the 21-foot-thick slab supporting the gate bay. At the ends of the lock, the deeper excavation required a wellpoint system to supplement the deep-well system.

cavation. Sand was stockpiled for use as backfill.

After the material was shaved down to grade, a 4-inch concrete work slab was placed. Numerous inserts in the concrete made convenient bracing points for the forms of the lower lift of the 12½-foot-thick base slab. Forming for the base slab, as well as the walls, is being carried out with Economy steel panels. To keep weight in balance, each of the two walls must go up at about the same time.

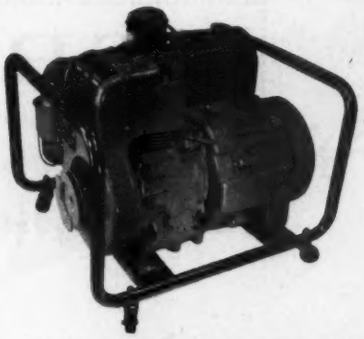
In the placing of the heavy network of reinforcing steel, the subcontractor saved time by grouping the bars before erection. About 10 vertical steel members were held in position by two sets of hardwood planks bolted together. The unit was handled by a crane and temporarily held in position by bracing welded to the horizontal steel. Since the wood clamps were positioned above the first lift of concrete, they remained in place until after the first lift was placed.

### Central mix plant

A central mix plant will supply the 200,000 cubic yards of concrete necessary for the lock. Aggregates (with a maximum size of 1½ inches) and sand are trucked in from a distance of about 70 miles. Trucks back up to one of three receiving hoppers. Inclined conveyors carry the material to three adjoining stockpiles. The material then drops to a horizontal belt in a recovery tunnel. The belt leads to the inclined conveyor that carries the material to the three Johnson bins of the plant. Noble automatic controls weigh out the batch, which is dropped to one of two Koehring 2-yard tilt mixers. A flat-bed truck, carrying two Blaw-Knox air-operated 3-yard buckets, delivers the mix.

Safety on the job is practiced by the men, and preached by J. Walter Smith, the safety engineer. At the time the job was visited by CONTRACTORS AND ENGINEERS, the men had worked 256 days without a lost-time accident.

For Brown & Root, Inc., J. E. Quillen is project manager and R. L. Gwinn is job engineer. Jethro J. McCullough—"Mr. Mac" to his men—is superintendent. For the Corps, Adolph Hedegaard, Jr., is the project engineer. THE END

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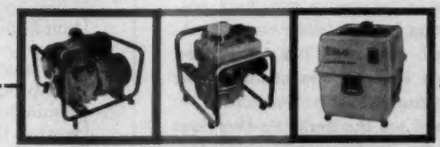

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# Avoid legal pitfalls

## Contractor was relieved of negligence liability

THE PROBLEM: *A workmen's compensation law requires a general contractor to carry workmen's compensation insurance for the benefit of a subcontractor's employees if the subcontractor fails to do so. If both the general contractor and the subcontractor carry insurance, is the general contractor relieved of common-law liability for negligence causing injury to a subcontractor's employee?*

THE ANSWER: Yes. (Thomas v. George Hyman Construction Co., 173 Fed. Supp. 381, decided by the United States District Court, District of Columbia.)

The court reasoned that the law does not give the general contractor the choice of carrying workmen's compensation insurance or subjecting himself to liability for negligence. He is required to carry insurance only if the subcontractor fails to do so, in which case, he may be free of all other liability. He may not, however, free himself from liability by voluntarily taking out insurance not required by law. In this case, the defendant was not obligated to carry compensation insurance because the subcontractor already carried it. Release from common-law liability is a benefit accruing from carrying compensation insurance only in case the law imposes a duty to do so.

## Materialman's rights under Miller Act

THE PROBLEM: *A materialman supplied material to a subcontractor on a military-base construction project, believing that the material would be used under the prime contract. The material was neither delivered at the job site nor used on the project. Having given the notice to the prime contractor required by the federal Miller Act, could the materialman receive the preferential payment benefits of the act?*

THE ANSWER: Yes. (Decided by the United States Court of Appeals, Fourth Circuit, in setting aside a contrary decision by the United States District Court, Eastern District of Virginia, Newport News, 275 Fed. 2d 57.)

## Contractor waived right to withdraw bid

THE PROBLEM: *After a city had accepted a bid for a municipal construction job, the bidder claimed that through mistake he had bid too low. But he signed a contract after the city refused to let him withdraw the bid, and did the work. He then sued the city for the excess cost above the contract price. Could he collect?*

THE ANSWER: No. (City of Cincinnati v. St. Paul Mercury Indemnity Co., 165 N.E. 2d 798, decided by the Ohio Court of Appeals, Hamilton County, Cincinnati.)

## Criminal interference with interstate commerce

THE PROBLEM: *A contract called for a supply of ready-mix concrete from the contractor's plant in Pennsylvania to another point in the state for the erection of a steel-processing plant. The contractor brought sand in from outside the state. One man was prosecuted under an indictment charging that he unlawfully used his influential union position to obstruct interstate commerce in the movement of the sand by extorting $31,274.13 from the contractor. He allegedly threatened to arouse labor disputes and to obstruct performance of the contract. (1) Did the evidence justify a conviction? (2) But, if so, was the conviction nullified because the trial judge had told the jury that they could consider not only the effect on importation of sand, but also incidental interference with interstate commerce involving steel shipments from the steel plant in Pennsylvania to other states?*

THE ANSWERS: Yes. (Stirone v. United States, 80 Sup. Ct. 270, decided by the United States Supreme Court.)

The court ruled that the United States District Court for the Western District of Pennsylvania, and the United States Court of Appeals, Third Circuit, had correctly decided that the accused was punishable for interfering with importation of sand, but set aside the conviction on the ground that the lower court erred in deciding that interstate shipment of steel products could be considered. The Supreme Court intimated that the indictment might have charged two distinct offenses, one charging interference with the importation of sand, and one charging interference with shipment of steel products. But the indictment charged only the first.

Under the federal Hobbs Act, on which the prosecution was based, there are two essential elements of a violation: interference with commerce, and extortion. Both elements have to be charged. Here, we cannot know whether the grand jury would have included in its indictment a charge that there had been inter-


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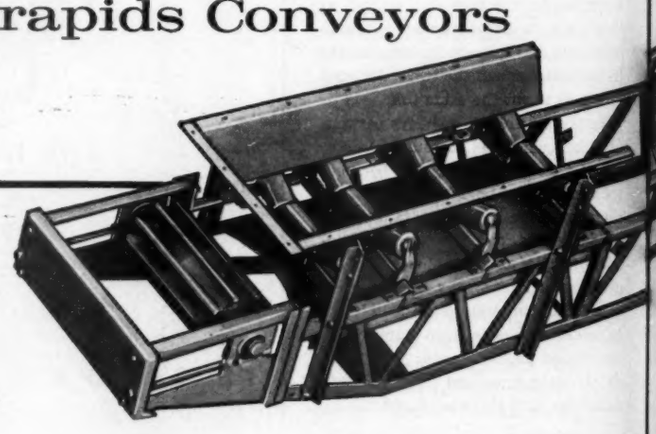
## is the word for new-design Cedarapids Conveyors



* Strong, Rigid construction is the prime requirement for a conveyor system that helps maintain a profitable operating pace and reduces your material handling costs. New-designed Cedarapids Lattice Frame Conveyors are engineered for strength and rigidity . . . they're "Strigid!"

What is the first thing to look for when you buy conveyors?

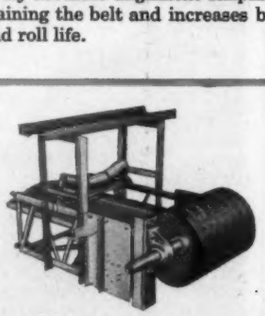
*Design and construction features that insure moving more tons at lowest cost per ton.*

And that's what you find when you look critically at the new "strigid" design of Cedarapids Conveyors!

*Strong* construction is a must for handling today's increasing hourly tonnages. Cedarapids' rugged truss design, with diagonal angle-steel side bracing the full depth of the truss, gives extra strength without extra weight; permits longer spans between supports with no sacrifice of stability. End frames are reinforced at each corner with gusset plates and securely fastened with 4-bolt connections to resist distortion from external stress. One of the many Cedarapids extra-strength design features is the wide use of clamp-on, hook-on mountings to eliminate bolt holes which tend to weaken the conveyor structure.

*Rigid* stability is another result of Cedarapids' "strigid" construction. Rectangular end frames between sections, reinforced with gusset plates, give added rigidity to joints. Frames are engineered for rigid, structural stability to support the load without weaving or buckling. Lateral cross bracing between side members assures extra resistance to wind sway.

*True alignment* is assured by pre-engineered "strigid" construction. Components are built on special fixtures and jigs, and jig-welded for the perfect alignment that comes with structural strength and rigidity. Truly accurate alignment simplifies training the belt and increases belt and roll life.



JIG-WELDED HEAD SECTIONS, box or taper styles, ruggedly designed for strength without increased weight. Wide-faced, crowned head pulleys are reinforced with extra discs for added strength. Carborundum-coated Safety-Grip Lagging reduces slippage and requires less belt tension.

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TROUGHING ROLLS and return idlers are made by Cedarapids for the absolute quality control that insures uniformity, perfect balance and maximum strength. Life-Seal ball bearings are permanently lubricated and sealed at the factory. Clamp-on mounting allows easy adjustment for belt training and for altering the standard 4' spacing to handle special applications.

*Adaptability* is another important savings benefit. Additional modular

ference with steel shipments from a nonexistent mill. Yet because of the court's instruction to the jury, this might have been the basis upon which the trial jury convicted the petitioner. If so, he was convicted on a charge never made against him.

## Subcontractor's liability for injury to employee

THE PROBLEM: *An asphalt company undertook resurfacing of a state highway and sublet. It sublet to the defendant company undersealing of the road, which required drilling holes through the old pavement, pumping hot asphalt into the cavity, and inserting a stake in the hole and withdrawing it in 15 or 20 minutes. A foreman and plaintiff, both regularly employed by the asphalt company, assisted in the undersealing. Defendant instructed these men how to do the undersealing, which involved some hazard in withdrawing the stakes if the hot asphalt had contacted underground water. In pulling a stake, plaintiff was injured when asphalt spewed from the hole. Was the defendant company liable?*

THE ANSWER: No. (Komeshak v. Missouri Petroleum Products Co., 314 S.W. 2d 263, decided by the St. Louis, Mo., Court of Appeals.)

The court said that the defendant company had discharged its duty to the plaintiff by using a standard method for undersealing operations, and by showing the plaintiff how and when to pull the stakes, thereby minimizing accident risks. Particular stress was laid on the instructions as to how much time should elapse between insertion and withdrawal of the stakes. "No one is required to guard against or take measures to avert that which is not likely to happen," the court decided.

## Workmen's compensation claimed by hauler

THE PROBLEM: *A quarry company furnished crushed rock to the prime contractor on a federal river-bank stabilization project. Smith, the hauler, provided his own truck, gas, oil and maintenance. He alone determined his working hours, the number of loads he hauled, and the regularity of the hauling. The company paid him 55¢ per ton for hauling the rock. While Smith was working, he tried to repair the truck and seriously injured his arm. He sued the company under the Arkansas Workmen's Compensation Act. The company resisted the claim on the ground that Smith was an independent contractor. Was Smith entitled to workmen's compensation?*

THE ANSWER: No. (Smith v. West Lake Quarry & Material Co., 329 S.W. 2d 167, decided by the Arkansas Supreme Court.)

The State Workmen's Compensation Commission decided that Smith was not an employee according to the compensation law, although the company withheld federal income tax on his pay and paid the social security and unemployment taxes on him.

The Supreme Court, in upholding the decision, said that such a relationship is generally determined by the commission from facts of the particular case. Withholding of social security and employment taxes by the alleged employer does not prove that he is actually an employer, but is a circumstance to be considered along with others in determining the relationship.

## Contractor was not wrongfully delayed

THE PROBLEM: *A municipal board of education entered into contracts with a general contractor and four other firms for plumbing and drainage, heating and ventilating, electrical work, and structural-steel and miscellaneous metal work. Time limits for completion of the contracts were to be binding on the respective contractors, subject to such extensions as might be authorized by the board or its agents. The general contractor sued the board, the architects, and the other contractors for damages, claiming he had been delayed in performing his contract. Did the trial judge properly dismiss the suit?*

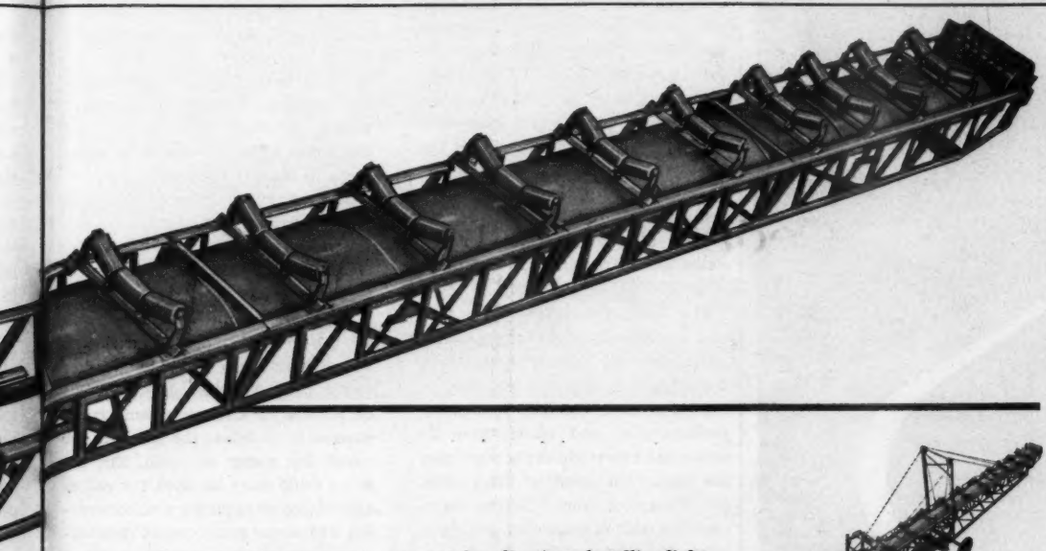
THE ANSWER: Yes. (Gherardi v. Board of Education of the city of Trenton, 147 Atl. 2d 535, decided by the New Jersey Superior Court, Appellate Division.)

The court ruled that officials of the board of education were exempt from personal liability under a clause of the plaintiff's contract. The supervising architects were not liable, since there was no contract between them and the plaintiff.

Time limits on the contracts were for the sole benefit of the board of education. Inability of any contractor to complete work within his time limit did not give the plaintiff any claim against him. Because the plaintiff's contract specifically provided for time extensions in the case of delays, he could not sue for damages on

## Edited by A. L. H. STREET
### Attorney-at-Law

*These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.*

CEDARAPIDS portable lattice frame conveyors are engineered with the same strong, rigid design as "strigid" stationary conveyors. Cable method of erection saves on maintenance. A self-locking independent hand or electric winch adjusts conveyor to any height up to 22°. Cedarapids Strigid portables are available in 18", 24", 30" and 36" widths, in lengths up to 70 ft.

INTERMEDIATE SECTIONS are jig-welded for true alignment. Rugged truss design permits longer spans between supports with no sacrifice of rigidity. 8', 10' and 12' sections available to adapt conveyors to any needed length in 2' increments.

conveyor components are always available from stock, ready for immediate delivery. You can extend or alter your conveyor system in the field with minimum time and cost. Add clamp-on troughing rolls to handle greater loads when necessary. Head and tail sections accommodate a useful range of shaft, bearing and pulley sizes without structural alteration.

Cedarapids "Strigid" Conveyors are pre-engineered to cover a wide range of applications, handling light or heavy materials horizontally or on an incline, with belt widths from 18" to 36", in any even foot length. Components are designed for fastest, easiest erection and quick field alterations to meet changing needs.

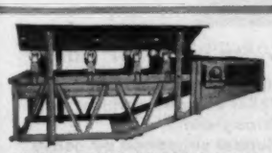
Start saving material handling money today. Your Cedarapids Dealer can give you a quick quotation for prompt delivery of your Cedarapids "Strigid" Conveyor.

*SEND FOR THESE NEW BULLETINS*

Cedarapids "Strigid" Conveyors incorporate so many new design features it takes a 16 page bulletin to describe all their money-saving, profit-making details. When you send for your copy of Conveyor Bulletin CON-2, be sure to ask for the new Conveyor Selection Manual containing necessary tables and charts and listing lengths, widths, drives, horsepower and all other data you need to select your tailor-made conveyor components "off the shelf."

**IOWA MANUFACTURING COMPANY**
**Cedar Rapids, Iowa**

Cedarapids



JIG-WELDED TAIL SECTIONS, in both taper and box styles, are interchangeable. Clamp-on hopper framework eliminates bolt holes to maintain structural strength. Self-cleaning wing type tail pulleys feature the same quickly detachable hubs used in the head pulleys.

**IOWA MANUFACTURING COMPANY**
Cedar Rapids, Iowa

Gentlemen: Please send Bulletin CON-2 with details about Cedarapids new-design Strigid Conveyors. Also send the Conveyor Selection Manual.

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S860-N

For more facts, use coupon or Request Card at page 18 and circle No. 285

## avoid legal pitfalls

account of delays caused by other contractors or school officials in failing to coordinate the work of the contractors. There was no proof that any of the defendants actively interfered with progress of the work.

The following provision of specifications, part of the school construction contract, barred the contractor's suit: ". . . apart from extension of time for unavoidable delays, no payment or allowance of any kind shall be made to the contractor as compensation for damages on account of hindrance or delay from any cause in the progress of the work, whether such delay be avoidable or unavoidable. . ." The plaintiff argued that the provision must be construed to mean "contemplated or unavoidable delays."

The plaintiff's damage claim against the board of education for delays caused by the other contractors, on the basis that the board was bound to terminate contracts which were being delayed, was invalidated. The court said that any right to so terminate a particular contract was for the board's benefit and not for the benefit of the other contractors.

## Concrete contractors required to get licenses

THE PROBLEM: *Did Illinois villages have a right to adopt ordinances requiring concrete contractors to secure licenses and pay a fee of $15 or $25 for construction of footings, foundations, and flat work?*

THE ANSWER: Yes. (Concrete Contractors Assn. of Greater Chicago v. Village of La Grange Park, 150 N.E. 2d 783, decided by the Supreme Court of Illinois.)

The court said that although the legislature had not explicitly authorized the adoption of such ordinances, it had impliedly done so by giving the villages general power to build streets, sidewalks, etc., and to regulate construction of buildings and other structures.

It was clear that the complaining contractors were engaged in sidewalk construction, and a description of that work was given. "Flat work" was described as including the construction of floors and sidewalks, which are generally installed near the end of the building construction. The work done by the plaintiffs in connection with "replacement of deteriorated concrete such as floors, walks, and driveways" was also mentioned.

The court reasoned that the fact that the legislature required masonry contractors to obtain licenses in municipalities with a population of 150,000 or more, based on proficiency examinations, and made these licenses valid throughout the state does not impair the power of other cities and villages to exact a license fee to meet the costs of inspecting and regulating the business of such contractors.

The licensing ordinances were designed to make effective the ordinance regulations concerning the construction of buildings, sidewalks, and the use of streets. In the court's opinion, they are necessary for that purpose and are valid.

Two dissenting judges argued that if cities and villages can license under these circumstances, then there is no practical limitation on the power to tax through the guise of licensing, and the door is open to the licensing of all forms of business to obtain revenue.

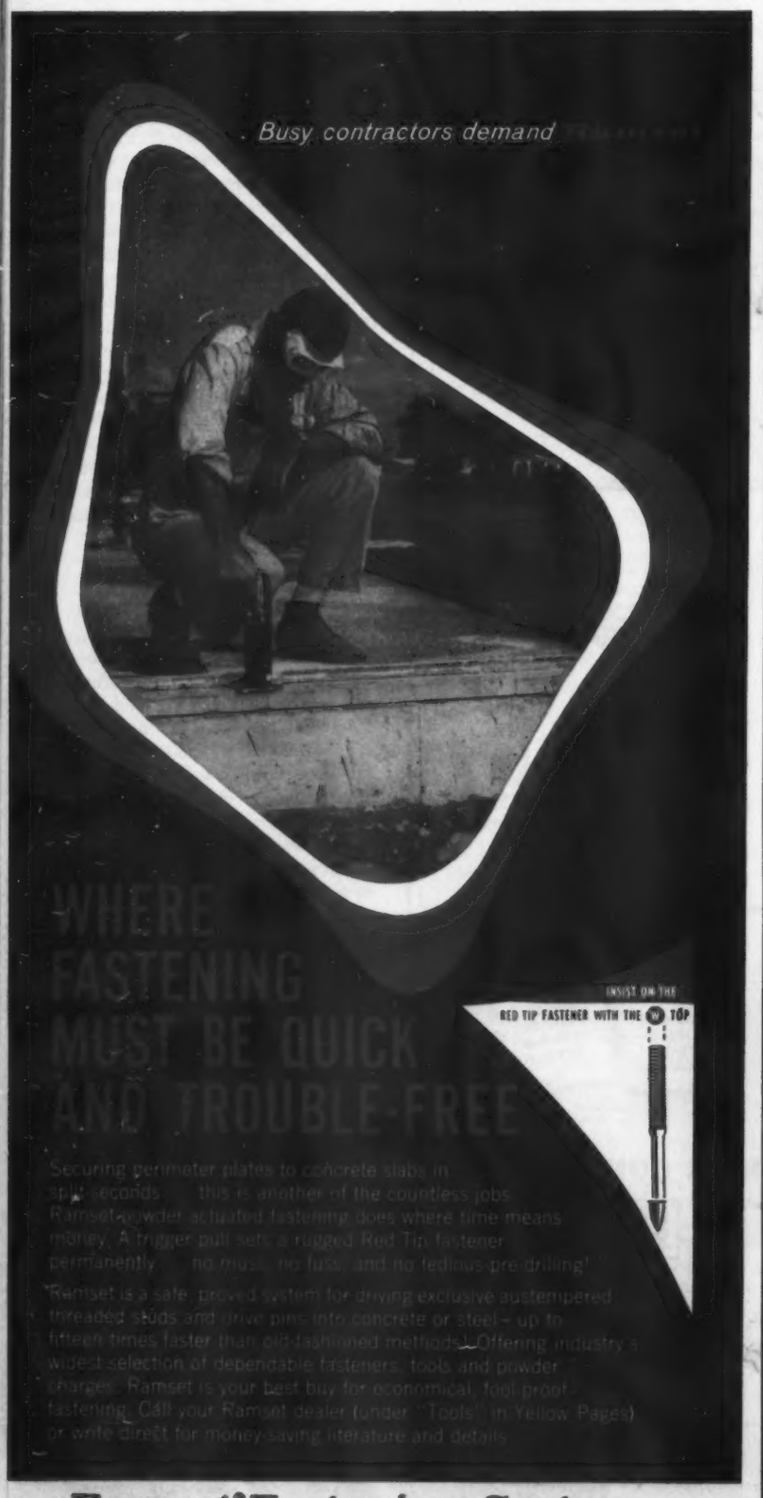
## Meaning of "highways" debated by litigants

THE PROBLEM: *A contractor was grading land bordering a highway. A gas company maintained a 6-inch transmission pipeline underground. During the contractor's bulldozing operations, the pipeline was damaged. The contractor was insured against liability for negligence, but the policy specified exclusion of liability for injury caused by mechanical equipment used in "excavating or drilling in streets or highways." Did the policy cover the contractor's liability to the gas company?*

THE ANSWER: Yes. (American Hardware Mutual Insurance Co. vs. Union Gas Co., 118 So. 2d 334, decided by the Mississippi Supreme Court.)

The court reasoned that uncertainty in the meaning of the exclusion clause should be decided in favor of the insured. The insurer should not be allowed by obscure or ambiguous exceptions to defeat the purposes for which the policy was sold. The insurer could have clarified the exclusion clause by applying it to excavating within the entire public right-of-way or easement, but he did not. Here the word "highways" can be interpreted in two ways, one including and one excluding the extreme boundaries of the right-of-way.

◀ For more facts, use Request Card at page 18 and circle No. 286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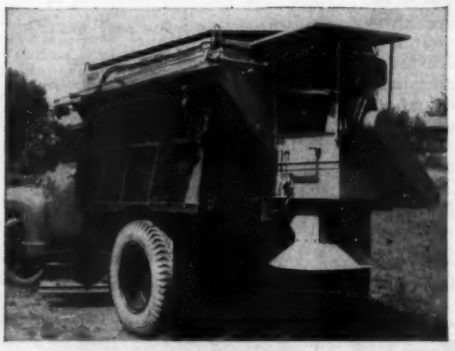

**A unique development in box-type spreaders**

All operations are controlled by driver in the cab. He raises or lowers the spinner for variable widths of spread, and controls the volume flow of materials.

*Spreads full width or half width on either side.*

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- Sealed automotive type reduction gear operates spinner.
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MANUFACTURERS OF EQUIPMENT FOR CONSTRUCTION AND MAINTENANCE OF ROADS AND STREETS
CRESTLINE, OHIO, U.S.A.

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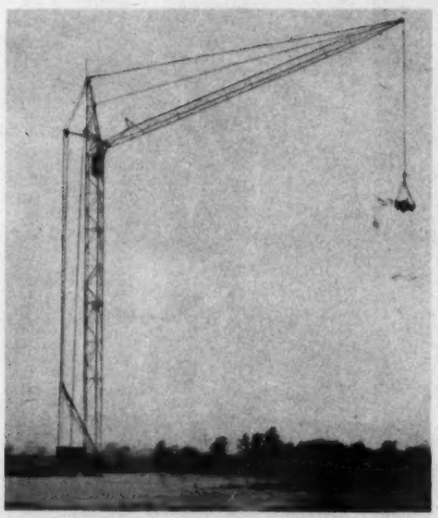
*For further information on any of the products described in the following section, circle the designated number on the Request Card at page 18.*

## Bituminous finisher rated at 400 tph

The T. L. Smith Co. announces a new asphalt finisher known as the Mark IV.

Mounted on rubber tires, this 400-tph unit offers paving speeds up to 102 fpm and traveling speeds up to 10 mph. Front and rear-wheel steering provides exceptional maneuverability and ease of handling, according to the manufacturer.

For further information write to The T. L. Smith Co., Dept. C&E, 2835 N. 32nd St., Milwaukee, Wis., or use the Request Card at page 18. Circle No. 109.



## Tower crane offers high production

A new electric-powered tower crane is available from the Bucyrus-Erie Co. for use on multistory erection and major construction projects.

Designated Mark I-50, this crane offers a combination of exceptional lifting height and reach with high line speed and mobility on rails.

With its flexible, building-height tower and 60 to 120-foot boom lengths, the unit reportedly can place up to 50 yards of concrete per hour under average conditions.

For further information write to the Bucyrus-Erie Co., Dept. C&E, South Milwaukee, Wis., or use the Request Card at page 18. Circle No. 111.

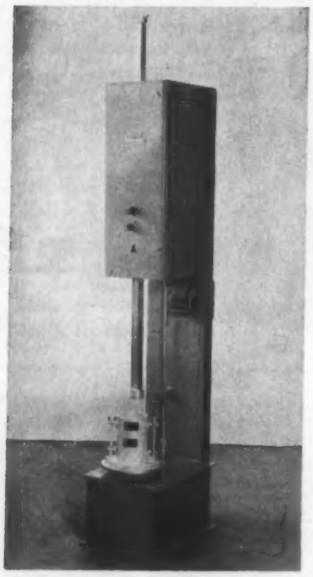
## Off-highway hauler has 60-ton capacity

LeTourneau-Westinghouse offers a 60-ton-capacity off-highway dumper designated Haulpak Model 60.

The unit weighs only 33 tons and is powered by a Cummins 550-hp diesel engine. Also standard is an Allison Torqmatic transmission with six speeds forward.

Top speed for the Model 60 is said to be 46.6 mph.

For further information write to LeTourneau-Westinghouse Co., Dept. C&E, 2301 N.E. Adams St., Peoria, Ill., or use the Request Card at page 18. Circle No. 110.



## Laboratory compactor for soil testing

A new mechanical compaction apparatus for laboratory use has been developed by Soiltest, Inc.

The apparatus accommodates both the standard 4-inch and modified 6-inch-diameter testing molds. The unit will operate with the standard compaction hammer, which weighs 5½ pounds and has a drop of 12 inches. For modified compaction tests, the hammer weight can be increased to 10 pounds, and the drop distance adjusted for 18 inches.

A feature of the new compaction apparatus is an automatic counter that automatically stops operation of the machine when a predetermined number of blows has been reached.

The compactor requires a floor space of only 13 × 23 inches. Its height is approximately 60 inches.

For further information write to Soiltest, Inc., Dept. C&E, 4711 W. North Ave., Chicago 39, Ill., or use the card at page 18. Circle No. 112.

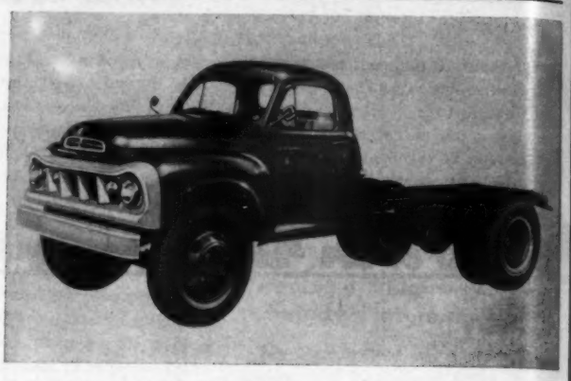
## Announce new admixture for concrete, mortar

A new, improved liquid admixture for concrete and mortar—Krete-X, with Trulon—is announced by Truscon Laboratories.

It is said to reduce the water ratio in concrete, induce high-early strength, speed the set, improve workability, and insure a denser texture. Truscon points out that Krete-X permits earlier finishing and, in cold climates, cuts down on the time required to protect fresh concrete from the damage of freezing. Krete-X can be added to ready-mix concrete at the job site or mixing plant.

Added to mortar, the admixture is said to reduce the possibility of cracking and shrinking, as well as increase strength and plasticity.

For further information write to Truscon Laboratories, Dept. C&E, Caniff St. and G.T.R.R., Detroit, Mich., or use the Request Card at page 18. Circle No. 98.



**Gross vehicle weights** range from 9,000 to 18,000 pounds on Studebaker Transtar medium-duty 1 and 1½-ton truck models. Gross weights on the heavy-duty 2-ton models range from 19,500 to 23,000 pounds. The Transtar is available as chassis-cab or with platform or stake bodies. For further information write to the **Studebaker-Packard Corp.**, Dept. C&E, South Bend 27, Ind., or use the Request Card at page 18. Circle No. 21.


# Firestone's Giant Tire Service keeps the wheels roll

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| Colorado, Denver | AC 2-8676 |
| Connecticut, Hartford | BU 8-1551 |
| Florida, Jacksonville | EL 4-1414 |
| Miami | OX 1-0060 |
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| Peoria | 637-7721 |
| Indiana, Indianapolis | ME 7-5461 |
| Iowa, Des Moines | AM 5-8395 |
| Kansas, Kansas City | HA 1-5542 |
| Wichita | LY 1-3485 |
| Louisiana, New Orleans | JA 5-8227 |
| Maryland, Baltimore | PL 2-3500 |
| Massachusetts, Boston | AV 2-0810 |
| Michigan, Detroit | WO 3-1060 |
| Grand Rapids | GL 1-2811 |
| Minnesota, Minneapolis | ST 9-2486 |
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| Syracuse | GR 5-0804 |
| North Carolina, Charlotte | EX 9-5[illegible] |
| North Dakota, Fargo | AD 5-04[illegible] |
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| Cincinnati | PA 1-[illegible] |
| Cleveland | BE 4-2[illegible] |
| Columbus | AM 7-43[illegible] |
| Oklahoma, Oklahoma City | JA 5-84[illegible] |
| Oregon, Portland | MO 5-81[illegible] |
| Pennsylvania, Harrisburg | CE 8-73[illegible] |
| Philadelphia | SA 7-29[illegible] |
| Pittsburgh | MO 1-21[illegible] |
| Tennessee, Memphis | WH 8-44[illegible] |
| Nashville | CY 1-41[illegible] |
| Texas, Dallas | FL 1-[illegible] |
| Houston | WA 3-7[illegible] |
| San Antonio | CA 7-77[illegible] |
| Utah, Salt Lake City | EM 4-36[illegible] |
| Virginia, Richmond | BE 3-69[illegible] |
| Washington, Seattle | MA 3-54[illegible] |
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## Loader-tractor-backhoe is integrated unit

The Hy-Dynamic Co. offers the Dynahoe, a new type of loader-tractor-backhoe constructed as a completely integrated unit.

In addition to easy operation and good visibility for both backhoe and loader controls, some of the features of the Dynahoe are: extra-heavy frame, buckets, booms, dipper, and other components. Other benefits include adequate tire flotation, power-shift forward and reverse transmission, torque converter, power steering, and planetary rear axle.

Struck capacities are 7½ cubic feet on the backhoe and ⅞ cubic yard on the loader.

For further information write to The Hy-Dynamic Co., Dept. C&E, Lake Bluff, Ill., or use the Request Card that is bound in at page 18. Circle No. 91.


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Super Rock Grip Wide Base* Super Rock Grip Deep Tread*
TUBELESS OR TUBED

u know how expensive tire downtime can be! The wer: keep it short. And with a Firestone Tire Expert on r project, it *will* be short. He'll do the worrying for you. ll keep the correct pressure in the tires for every dition. Many times, he'll put the finger on trouble re it happens. But if trouble happens fast, he'll fix it . He can match new tires to any job, any rig—tires t with Firestone Rubber-X, the longest-lasting rubber r used in Firestone tires plus the extra strength of Shock-tified nylon cord. So let Firestone take some of the risk of those low bid jobs. Firestone Giant Tire Service is of the best hedges against deadline pressure.

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*...ne in Eyewitness to History every Friday evening, CBS Television Network.*

For more facts, use Request Card at page 18 and circle No. 358


## Announce rock crusher with one moving part

Pulvo-Matic, a new type of rock reducer, reportedly will crush all kinds of rocks for aggregate, or can be used to crush limestone or other minerals to lumps of specified sizes.

The aggregate sizes are accurately controlled and are said not to be affected by the wear and tear of hammers, jaws, or rolls. The only moving part is a rotor cage of cast manganese steel, which works in conjunction with manganese-steel liner or breaker plates.

The amount of impact needed for any particular size of aggregate is easily established by regulating the rotating speed of the cage. The faster the speed, the finer the aggregate, for any given material. A cleaner, more cubical aggregate is produced with less dust, fines, and slivers to waste material, states the manufacturer.

The unit requires no extensive brickwork or heavily reinforced foundation. It is mounted on its own steel base, and can be set up where needed on a quickly prepared mounting. Three models of the Pulvo-Matic are available to cover a full range of capacities from 10 to 250 tons of aggregate per hour.

For further information write to the Frog, Switch & Mfg. Co., Dept. C&E, P. O. Box 431, Carlisle, Pa., or use the Request Card at page 18. Circle No. 49.

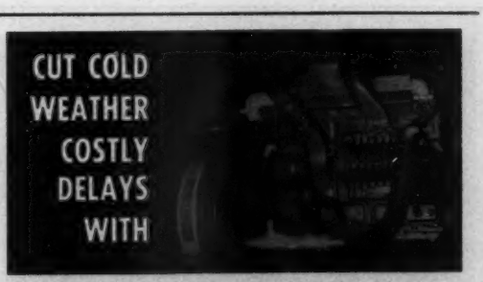
## Folding steel barricade extends to 8 feet

A new folding steel barricade is announced by the Albert W. Pendergast Safety Equipment Co.

The unit is designed to open instantly to a full 8-foot width, and to retract to less than 12 inches when not in use.

Durable all-metal construction is a feature. Two red fluorescent danger flags are furnished. Flashers are optional.

For further information write to the Albert W. Pendergast Safety Equipment Co., Dept. C&E, Tulip and Longshore Sts., Philadelphia 35, Pa., or use the Request Card that is bound in at page 18 of this issue. Circle No. 52.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Electric Pre-Heater for Diesel and Gasoline Engines

Equipment kept warm between operating periods, ready for instant action. Ideal for units with Torque Converters. KIM prevents cold weather damage; reduces wear and costly down-time. Plugs into electric circuit; draws off cold water from engine; heats and circulates it through engine. Approved and used by all major engine manufacturers.

SEE YOUR DEALER or write for free literature:

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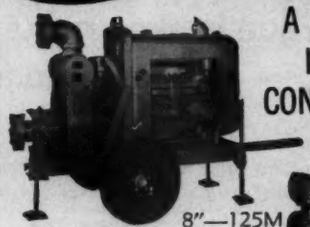
RICE RICE PUMPS

A Complete Line for CONTRACTORS



6"—90M
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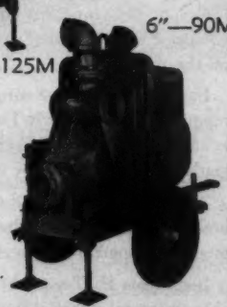
CENTRIFUGALS
All Standard AGC Sizes 1½" to 10"
Air and water cooled power—Modern Design—Precision built.



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2", 3", 4" SINGLES
BIG 4" DOUBLE
Single and double styles—48 to 1 reduction—gearing fully enclosed and operates in oil.

MASONRY CUTTERS
12 and 30 Ton Sizes

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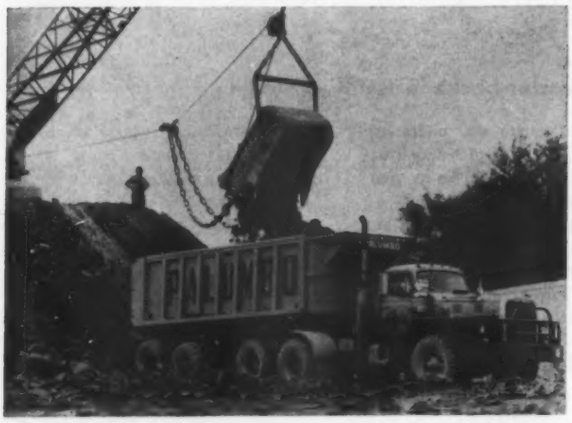
For more facts, use Request Card at page 18 and circle No. 360



**Newest additions to the 60-truck fleet** of Palumbo Excavating Co., Chicago, are two International Model F-230-D tractors. Capable of carrying gross loads of 72,000 to 120,000 pounds, the diesel-powered tractors have been placed in service with 26-yard dump trailers hauling fill from excavation sites on Chicago's Congress Street Expressway. The heavy-duty Internationals are equipped with 220-hp diesel engines, tandem axles, 5-speed transmissions with 4-speed auxiliaries, and 169-inch wheelbases. For further information write to the **International Harvester Co.**, Dept. C&E, 180 N. Michigan Ave., Chicago 1, Ill., or use the Request Card at page 18. Circle No. 50.

## Hi-Torque brakes make underground hauling safer; hold 44 tons on 20% grades

This shuttle car is one of several KW-Dart vehicles in use at the White Pine Copper Company mine at White Pine, Michigan. The cars are equipped with B.F.Goodrich Hi-Torque brakes, designed for heavyweight off-the-road vehicles.

Each car weighs 44 tons fully loaded with copper ore. White Pine reports the ability of Hi-Torque brakes to handle such heavy loads safely is an outstanding advantage. With full loads, the vehicles hold on steep grades encountered in the mine, ranging up to 20 percent.

The cars are being used on a round-the-clock basis, 7 days a week, with brakes applied most of the time the vehicles are moving. Yet in several months of operation no maintenance or replacements have been required.

Investigate Hi-Torque brakes for your heavy duty vehicles...now available on several makes of equipment. For booklet write *B.F.Goodrich Aviation Products, a division of The B.F.Goodrich Company, Dept. CE-12, Troy, Ohio.*

Closeup of Hi-Torque brakes on shuttle car wheel. The cars are used over hilly, rocky and muddy terrain.

**B.F.Goodrich** Hi-Torque brakes

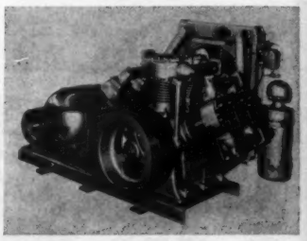
For more facts, use Request Card at page 18 and circle No. 290


### Introduce new line air compressors

A new line of 100-pound air compressors in the 25 to 100-hp range has been introduced by Clark Bros. Co.

Designated the C-Line, these 2-stage, air-cooled units are said to be lightweight, compact, easy to install, and easy to maintain.

W-Type construction shortens overall crankshaft and compressor length, thereby minimizing floor-space requirements. According to the manufacturer, the good running balance of the machine simplifies foundation requirements and permits installation in a wide variety of indoor and outdoor locations. The compressor can be bolted directly to a good concrete floor, or mounted on a relatively thin concrete slab—often close to the point of air consumption.



A constant-speed load and unload device is furnished as standard equipment. For intermittent operation, an optional dual control permits operation on start-stop duty for both motor and compressor, or may be set for continuous motor operation and free air compressor unloading.

Built in 25, 50, 75, and 100-bhp sizes, C-Line compressors are available as a basic compressor, base-mounted compressor less motor, or complete base-mounted package including electric motor drive.

For further information write to the Clark Bros. Co., Dept. C&E, 621 17th St., Olean, N. Y., or use the Request Card that is bound in at page 18. Circle No. 113.

### Offer cold-water gun for cleaning equipment

To facilitate switching from hot-solution cleaning to cold-water blast, a separate high-pressure cold-water gun is offered for Malsbary 250 HPC (hydraulic pressure combination) cleaners.

New models are available with the gun already connected, or it may be installed on models in the field by adding a cold-water valve.

According to the manufacturer, this gun increases the effectiveness of the cold-water blast because its V-type hand grips and short, round nozzle enable the operator to get in close to the area to be cleaned with the blast's full force.

On the 250 HPC cleaner, the gun delivers up to 360 gph at 300 psi.

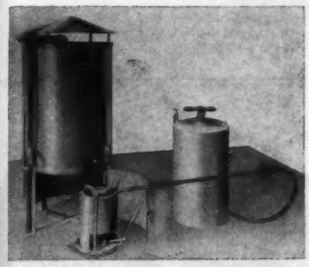
For further information write to the Malsbary Mfg. Co., Dept. C&E, 845 92nd Ave., Oakland 3, Calif., or use the Request Card at page 18. Circle No. 10.

## Hot-water heaters aid winter concreting

Aeroil Products Co., Inc., has announced a new line of self-contained portable, coil-type hot-water plants.

Available in two sizes, the units deliver as much as 1,600 gph of water with a 50 degree F temperature rise or 800 gph with 100 degree F temperature rise.

They are said to be ideal for ready-mix producers, paving contractors, and general contractors because, unlike stationary steam plants, they can be moved easily with a small crew. They are equipped with carrying handles.



Self-contained and easily portable, the Aeroil heaters are offered with either kerosene or LP-gas burners.

The units are available with either kerosene or LP-gas burners, and windshields are provided. Burners are mounted on swinging doors for easy igniting.

Inlet and outlet are 1½-inch standard pipe, male thread. A drain pipe is provided for use in freezing weather.

For further information write to the Aeroil Products Co., Inc., Dept. C&E, 9 Wesley St., South Hackensack, N. J., or use the Request Card at page 18. Circle No. 17.

## Trailer straddles load, picks it up, unloads it

Challenge-Cook Bros. Inc., announces the Straddle Trailer.

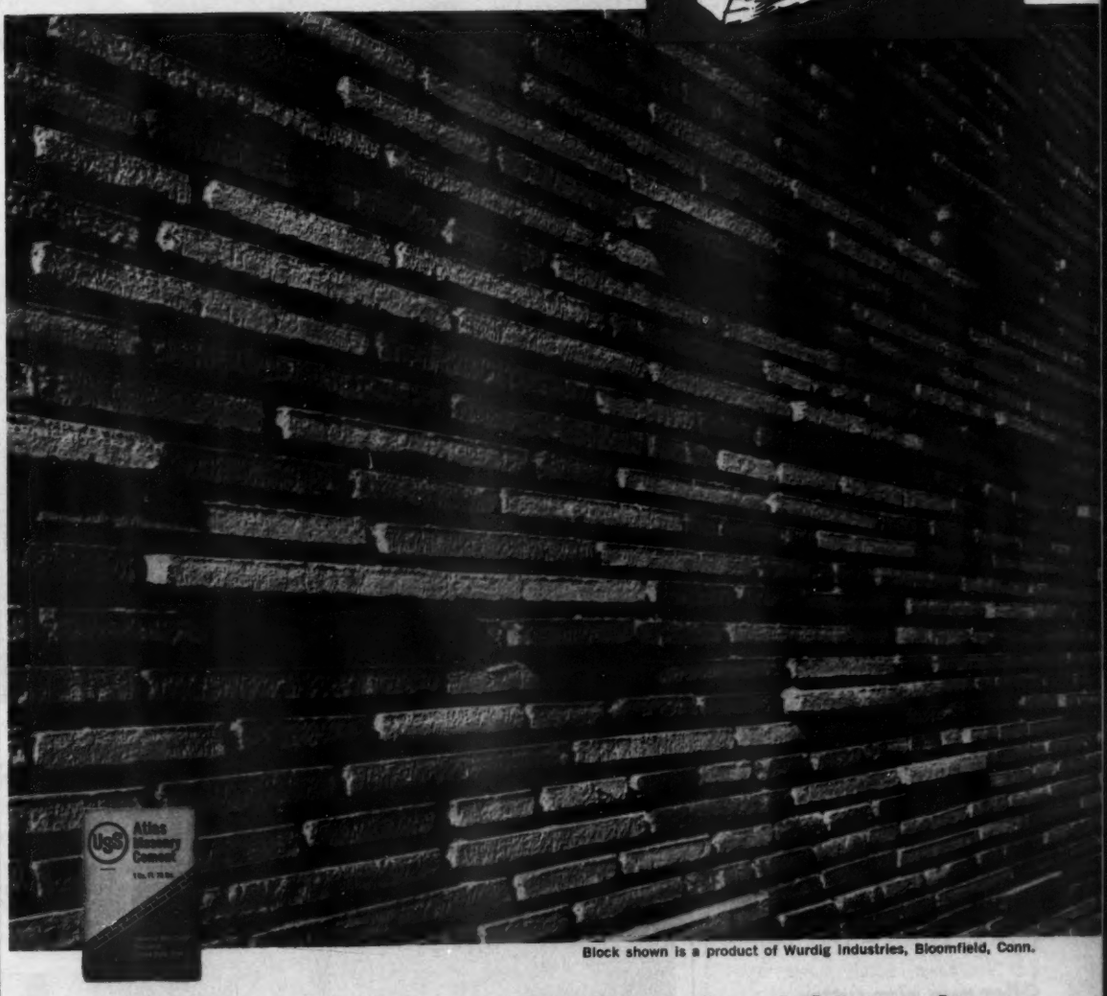
This unit, which has its own hydraulic system, picks up the load, holds it secure while traveling, and unloads at the job site. The complete load-haul-unload cycle is easily handled by the rig's operator. The models available can haul payloads up to 40,000 pounds, states the manufacturer.

When the load has been stacked on pallets or common wood blocks, the operator backs the trailer over the load (walking-beam construction eliminates the through axle on the rear tandem). He operates the trailer hydraulic lifting mechanism by simple control levers located either inside the truck cab or at the front of the trailer. At the touch of a lever, the trailer picks up the load, pallets and all, and automatically centers it as it is raised to transport position.

For further information write to Challenge-Cook Bros., Inc., Dept. C&E, 3334 San Fernando Road, Los Angeles 65, Calif., or use the Request Card that is bound in at page 18. Circle No. 59.

**Using a 12-foot boom extension** and an 8-foot blade on its Gradall, the Gradall Excavation Service, of Ludlow, Mass., completes a finish grading job without ever leaving the highway. This was done on a project near Hebron, Conn., where a new 5-mile section was being built. For further information write to **The Warner & Swasey Co.**, Dept. C&E, 5701 Carnegie Ave., Cleveland, Ohio, or use the Request Card at page 18. Circle No. 89.


**Great new things are shaping up in concrete block**




Block shown is a product of Wurdig Industries, Bloomfield, Conn.

# Atlas Masonry Cement provides the right mortar

This is "slump block." It is a decorative concrete masonry unit that resembles adobe brick or weathered stone. Usually integrally colored, "slump block" produces unusual effects in masonry construction. It is available from local concrete block producers in a variety of widths, lengths, colors and textures.

Whether "slump block" or other masonry units are used, ATLAS MASONRY CEMENT continues to be the preferred basic material in mortar. It makes a smooth, workable mix... gives a strong bond... provides durable joints that are uniform in color. Complies, too, with rigid ASTM and Federal Specifications. Literature on request. Universal Atlas, Dept. M, 100 Park Avenue, New York 17, N. Y.

**Universal Atlas Cement**
**Division of**
**United States Steel**

M-82

"USS" and "Atlas" are registered trademarks

OFFICES: Albany • Birmingham • Boston • Chicago • Dayton • Kansas City • Milwaukee • Minneapolis • New York • Philadelphia • Pittsburgh • St. Louis • Waco

For more facts, use Request Card at page 18 and circle No. 291

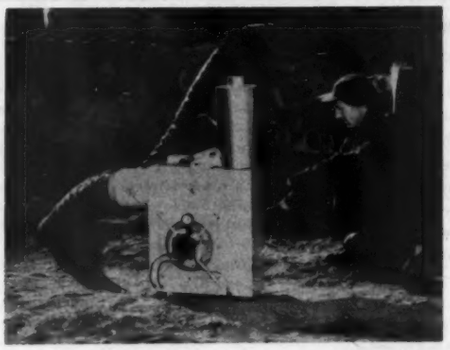
## Heaters warm engines for winter starting

Hot-air heaters designed to solve diesel starting problems, as well as to heat sheltered construction areas, are available from Morrison-Pelsue Co.

The heaters have long, flexible Spiratube arms, which are so lightweight that one man can handle lengths up to 15 feet. For easy handling, this length retracts into a 26-inch carrying case.

The air-handling capacity of the heater is 1,200 cfm. When required, two hoses can be attached for supplying heat to two places at the same time.

For further information write to the Morrison-Pelsue Co., Dept. C&E, 2256 S. Delaware St., Denver 23, Colo., or use the Request Card at page 18. Circle No. 35.

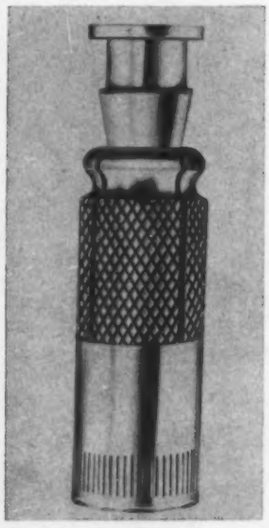


This Caterpillar tractor is being preheated for cold-weather starting by a Morrison-Pelsue heater. The flexible tubing carries 1,200 cfm of hot air to the tractor engine.

## New-type steel anchor is time-saving unit

The U. S. Expansion Bolt Co. announces a new type of alloy-steel anchor designated Drilset.

Constructed with a preassembled expander plug, the Drilset anchor



eliminates the need for chucks and cuts installation from the usual six steps to two. After drilling the hole, the Drilset is set and tight after a few strokes from an ordinary mallet or hammer.

The new anchor has wide applications and is designed for use in concrete, brick, or concrete block.

Holding power ranges from 2,880 to 11,500 pounds. Four sizes are available: ¼, ⅜, ½, and ⅝ inch.

For further information write to the U. S. Expansion Bolt Co. Dept. C&E, York, Pa., or use the Request Card that is bound in at page 18. Circle No. 73.

## Offer new pipe cutter for large water mains

The Wheeler Mfg. Corp. announces its Super hydraulic pipe cutter, designed for use on 10 through 20-inch-diameter cast-iron water main.

No accessory equipment is required. The unit is readily installed on the pipe by two men, and the pipe is then quickly and easily cut by one man.

For further information write to the Wheeler Mfg. Corp., Dept. C&E, Ross St., Ashtabula, Ohio, or use the Request Card bound in at page 18. Circle No. 96.

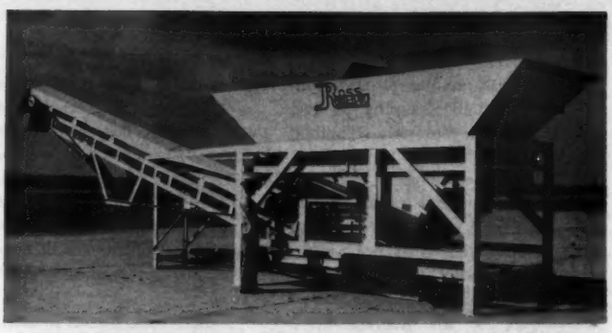
Excellent maneuverability and all-wheel drive make the TS-14 an ideal machine for land clearing, grading plant sites, etc. Self-loading sand and clay at this housing development, the "Twin" handled clearing and grading work for streets and home sites.

Low, wide bowl and 4-section cutting edge speed loading in any scraper material . . . blade sections are adjustable, reversible and identical. Ability to work without pusher assistance makes this "Twin" an efficient scraper for stripping jobs in sand and gravel operations, mines, and quarries.

GM GENERAL MOTORS EUCLID

EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE



Its simple design is said to make the new Ross Porta-Plant more efficient in production and easier to disassemble, move, and set up.

## Portable batch plant produces up to 60 tph

A 30-ton decumulative portable batch plant is introduced by the Ross Porta-Plant Co.

Designed to be set up in less than an hour, the plant needs only a small dirt ramp to make it accessible for front-end loader charging. Its low profile places the overhead bin only 11 feet from the ground.

The 30-ton bin combined with the new decumulative weigh system eliminates the need for a weigh batch bin. Several batches of concrete can be weighed out without recharging the storage bin. Batches of any size up to and including 7 yards can easily be weighed out by one operation, according to the manufacturer.

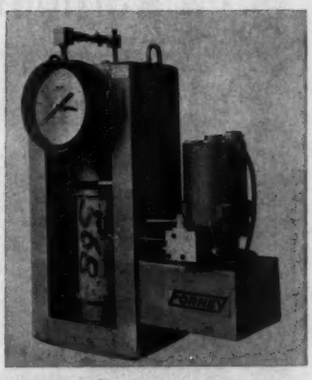
The plant reportedly can produce 60 yards of concrete per hour.

For further information write to Ross Porta-Plant, Dept. C&E, Box 446, Brownwood, Texas, or use the card at page 18. Circle No. 22.

## Portable concrete tester eliminates manual pump

The Tester Division of Forney's, Inc., announces the completely power-operated Model FT-30 portable compression machine with a widely variable speed of loading.

The conventional manually operated pump is eliminated because, in addition to the variable-speed feature, the new power-control unit embodies a rapid traverse that permits fast preloading of the specimen.



The speed at which a specimen is loaded can be preset according to the applicable ASTM or AASHO specification and, if desired, it can be varied while the test is in progress.

It is claimed that, with the Model FT-30 job-site tester, it is possible to conform fully to ASTM and AASHO specifications for rate of loading.

For further information write to Forney's, Inc., Tester Division, Dept. C&E, P. O. Box 310, New Castle, Pa., or use the Request Card at page 18. Circle No. 77.

## Tough pneumatic tire protected by steel

An armor-plated pneumatic tire said to be invulnerable to practically all puncturing objects encountered on debris-littered construction sites has been introduced by The B. F. Goodrich Co.

This tire has two plies of steel cables imbedded in the rubber beneath the tread. Made with an all-purpose tread, the tire is available in sizes to fit all popular-make material-handling equipment.

For further information write to The B. F. Goodrich Co., Dept. C&E, 500 S. Main St., Akron 18, Ohio, or use the Request Card at page 18. Circle No. 30.

◀ For more facts, use Request Card at page 18 and circle No. 292

*all-wheel drive "EUC" is a one man spread!*

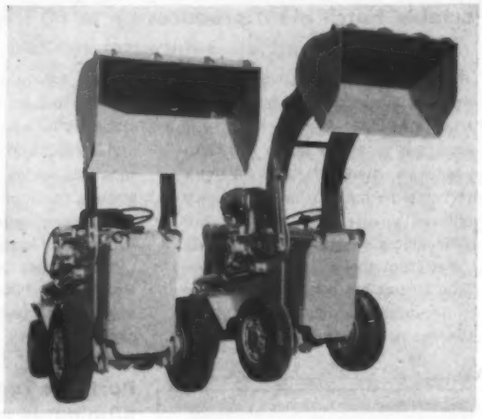
another Euclid engineering advancement . . .
"Twin" puts more profit in every payload!

Here's performance and work-ability in a 14 yd. scraper . . . 20 yds. heaped . . . that's way ahead of any machine of comparable size. With two engines and separate Torqmatic Drives for each axle, the TS-14 provides all of the cost cutting advantages of all-wheel drive in a medium size scraper.

This new "Twin" self loads in practically any material and with a pusher for loading it's a big producer on even the toughest jobs. There's plenty of power and traction to get a heaped load in a hurry . . . to get out of the cut or borrow pit fast . . . and to really highball on the haul road. The TS-14 does a wide range of work, with or without a pusher, and is the most versatile scraper in its class.

Steep grades and adverse conditions that slow down or stall other scrapers are routine for the "Twin" . . . it can work more days per season and give you a bidding advantage on that next job or cut earthmoving costs on your present work. Get the performance facts from your Euclid dealer or write for the new catalog No. 555.

EUCLID DIVISION OF GENERAL MOTORS • CLEVELAND 17, OHIO
*Plants at Cleveland and Hudson, Ohio and Lanarkshire, Scotland*



The high-dumping-clearance Yale Y-18 tractor shovel is shown on the right compared with a standard Yale model. The new model provides a clearance of 7 feet 2 inches.

## Tractor shovel designed for extra-high lifts

To meet bulk-handling situations in which extra-high dumping is required, the Yale Materials Handling Division of The Yale & Towne Mfg. Co. has developed a special high-lift model of its industrial tractor shovel.

The new units provide a full 7 feet 2 inches of dumping clearance, an increase of 14 inches over Yale standard models.

According to the manufacturer, high dumping clearance in the special Y-18 tractor shovel has been accomplished with no sacrifice to the unit's digging capacity, full-load 45-degree bucket tip-back carry position, and over-all speed of operation.

Capacity of the tractor shovel is 1,600 pounds. The angle of dump with the higher bucket is 43 degrees.

Necessary lengthening of the Y-18 to achieve the high dump clearance adds only 10 inches to the turning radius, permitting ample maneuverability to operate in and out of freight cars.

Longer bucket arms to increase the height provide a maximum reach of 42 inches achieved with the bucket at a height of 53 inches.

The special tractor-shovel units can be provided with a full range of buckets from 12 to 27 cubic-foot capacity.

For further information write to The Yale & Towne Mfg. Co., Yale Materials Handling Division, Dept. C&E, 11,000 Roosevelt Blvd., Philadelphia 15, Pa., or use the Request Card that is bound in at page 18. Circle No. 114.

## Three-phase rectifier dc arc welders offered

The Lincoln Electric Co. announces a complete line of new 3-phase rectifier dc arc welders for general use in structural and maintenance welding.

The Idealarc R3M series, designed to NEMA standards of 40 volts, 60 per cent duty cycle, incorporates silicon rectifiers to produce dc output in four sizes: 300, 400, 500, and 650.

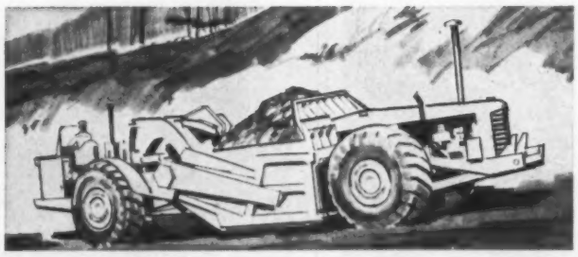
Output characteristics of the new rectifier have been specifically designed to prevent electrode sticking on low-current, small-diameter electrode applications. Standard equipment includes a polarity switch for reversing current flow without changing cable connections.

Larger-size models can serve double duty as a power supply for semiautomatic submerged-arc welding and as a hand welder.

Optional accessories include a 3-wheel undercarriage for portable mounting; an ML-2 power pack, needed to transform the welder into an automatic welder power supply; and an accessory kit consisting of head shield, electrode holder, ground clamp, and cables.

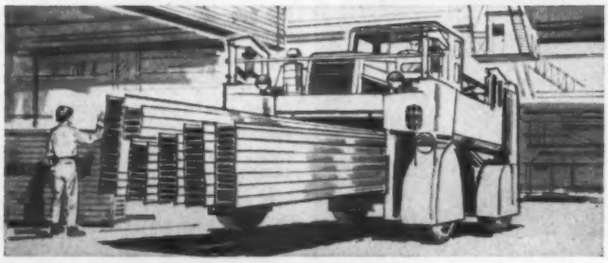
For further information write to The Lincoln Electric Co., Dept. C&E, P. O. Box 3115, Cleveland 17, Ohio, or use the Request Card at page 18. Circle No. 69.


# ALLISON
## smooths out starts
# TORQMATICALLY



### IN 14-YARD SCRAPERS

"Twin Power"—made possible by twin Allison CT-3340 TORQMATIC DRIVES in this Euclid TS-14 scraper—makes every operation smoother. Production is as much as 100% higher, cost per yard 50% less, than for scrapers pulled by tractors.



### IN STRADDLE CARRIERS

"Easy Does It" for 30-Ton Loads—Equipped with an Allison CT-3340 TORQMATIC DRIVE, this Gerlinger Material Handler starts 20- and 30-ton loads slick as a whistle for an Eastern steel producer. Unit works 24 hours a day, five days a week, has cut steel handling costs 50%.

### IN ANY 125-175 H.P. UNIT

Small off-highway trucks, fire trucks, airport tow tractors, graders—a whole long list of equipment becomes better equipment with an Allison CT-3340 TORQMATIC DRIVE.

This torque converter-hydraulic transmission team has 4 speeds forward, 2 reverse—converter-driven PTO—drive line parking brake—full power shifts at all speeds—optional lockup clutch—can be direct or remote engine mounted.

Want more information? Send for the fact-packed CT-3340 brochure today.

Allison TORQMATIC
TORQMATIC® DRIVES

The world's most complete line of hydraulic drives

*Over 980 Models Used by 108 Manufacturers in 100 to 525 H.P. Equipment*

Allison Division of General Motors
Dept. CE-1, Indianapolis, Indiana

Please send me application data on your CT-3340 TORQMATIC DRIVE.

Name_____

Title_____

Company_____

Address_____

City_____ State_____

For more facts, use coupon or Request Card at page 18 and circle No. 293

**This tandem vibrating roller,** a Zettelmeyer Model VL 1a, is a 3,000-pound self-propelled machine with a compaction effect of up to 12 tons. The roller has a rolling width of 40 inches, and can be used as a vibrating or static roller, as desired. It is powered by an 8-hp air-cooled diesel engine and has two forward and two reverse speeds. Vibration frequency is 3,750 vpm; climbing capacity is approximately 1:4. The 87-inch-long roller turns in a 15-foot radius. Water sprinklers for the rolls are standard equipment. Due to the construction of the roller, none of the vibrations are transmitted to the operator, states the manufacturer. For further information write to **Zettelmeyer,** Dept. C&E, 10 E. 40th St., New York 16, N. Y., or use the Request Card at page 18. Circle No. 51.

## New asphalt heater in compact trailer

The Industrial Boiler Co., Inc., announces its new Chattanooga Model 106-0 asphalt heater, designed to bring asphalt from a cold start to operating temperature in approximately one hour.

Firing is necessary only when the asphalt plant is in operation. The exhaust-stack temperature averages only 10 degrees above asphalt temperature.

Completely self-contained in a compact trailer, the unit becomes portable in 30 minutes, according to the manufacturer.

For further information write to Percy E. Todd, sales manager, Industrial Boiler Co., Inc., Dept. C&E, P. O. Box 9126, Chattanooga, Tenn., or use the Request Card at page 18. Circle No. 33.

## New mobile radio set is small, lightweight

A new 15-watt VHF-FM mobile radio set called Slimline is announced by Aeronautical Electronics, Inc.

Less than 5 inches high, the unit is said to fit easily under the dash in any car or truck. All Slimline sets have provision for a maximum of three transmit and receiver channels, and have built-in provision for the

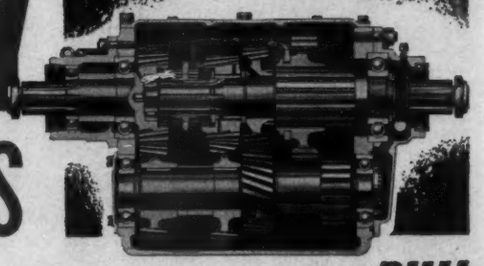
simple plug-in installation of Unicall at any time in the field. Unicall is the manufacturer's selective call system, said to permit sharing of crowded frequencies without interference.

Ease of maintenance is another feature of the Slimline.

For further information write to Aeronautical Electronics, Inc., Dept. C&E, P. O. Box 6527, Raleigh, N. C., or use the Request Card that is bound in at page 18 of this issue. Circle No. 100.


NEW 4-SPEED AUXILIARY TRANSMISSIONS

MODELS 4-B-73 AND 4-B-75



SPLIT GEARS AND *GO*...SHIFT INTO DEEP REDUCTIONS AND *PULL*

You no longer have to pay a premium price for a 4-speed auxiliary which is heavier than your operation demands. Save weight *and* money with one of the new Fuller 4-speed Auxiliaries equipped with overdrive, direct, low and low-low gear ratios in one compact, 375-pound unit. Get gear-splitting ratios plus deep reduction.

The Fuller 4-B-73 is designed for use with engines producing approximately 500-600 lb./ft. of torque. Use of special high-capacity bearings permits the 4-B-75 to be used with engines in the 600-700 lb./ft. torque class.

Get all the extras of price, performance and payload. Specify the new Fuller 4-B-75 4-speed Auxiliary Transmissions. For full details, see your truck dealer or write Fuller Manufacturing Company.

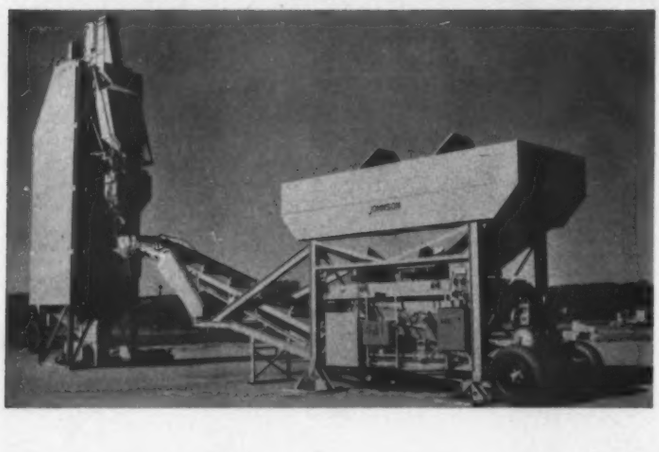
**GEAR RATIOS**
***Models 4-B-73 and 4-B-75***

| | |
|---|---|
| Overdrive | .85 |
| Direct | 1.00 |
| Low | 1.24 |
| Low-Low | 2.22 |

FULLER
TRANSMISSION DIVISION
MANUFACTURING COMPANY
KALAMAZOO, MICHIGAN
*Subsidiary EATON Manufacturing Company*

Unit Drop Forge Div., Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla. Automotive Products Company, Ltd., Automotive House, Great Portland Street, London W.1, England, European Representative

For more facts, use Request Card at page 18 and circle No. 294



During moves, the charging hopper and batcher on the Rover's cement unit remain attached. When the unit is erected, the hopper and batcher hinge into position over the discharge hood.

## New transit-mix plant is highly mobile unit

A new 100 to 120-cubic-yard-per-hour mobile transit-mix plant called the Rover has been announced by the C. S. Johnson Co.

The Rover is only 8 feet wide and 13 feet high to permit highway travel in most states without special permits. It consists of two units—aggregate and cement—each equipped with complete running gear including wheels, axles, and pneumatic tires for fast, easy attachment to tractor. Wheels remain attached to both cement and aggregate units during operation.

The cement unit includes a 1-compartment 395-barrel silo; 3-cubic-yard batcher; 200-barrel-per-hour bucket elevator; 200-barrel-per-hour screw conveyor; 10-cfm low-pressure air compressor; and complete running gear as standard equipment.

The aggregate unit includes a 3-compartment bin with 39-cubic-yard capacity; 3-cubic-yard batcher; 30-inch conveyor complete with water piping installed to the discharge hood; 10.6-cfm compressor; running gear; and built-in raintight control panel with master switch, fuses, full-voltage magnetic starters, and push buttons for each motor as standard equipment.

For further information write to the C. S. Johnson Co., Dept. C&E, P. O. Box 71, Champaign, Ill., or use the card at page 18. Circle No. 65.

## Earth-boring rig drives 4½-inch augers 75 feet

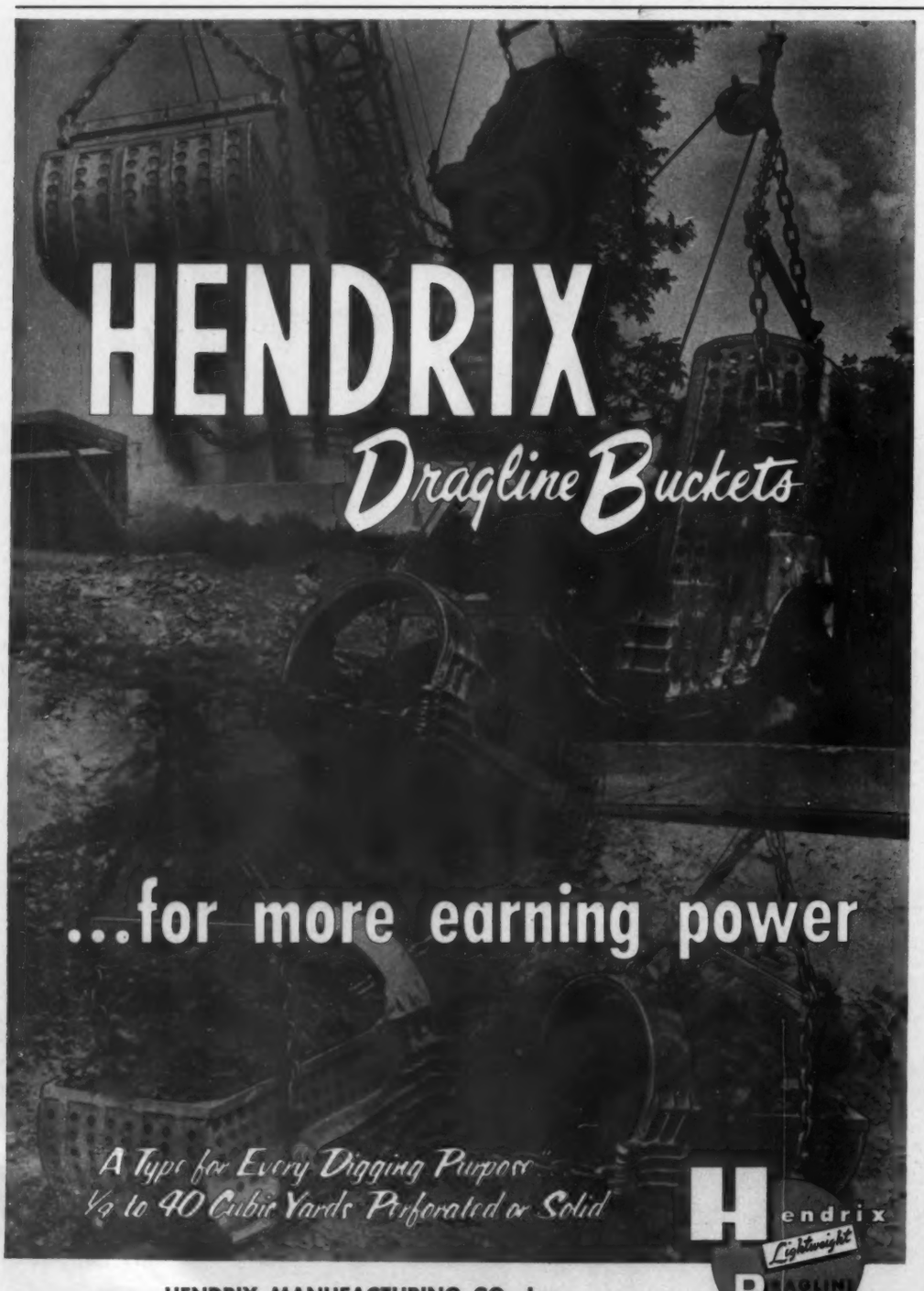
The hydraulic-powered Apache announced by Mobile Drilling, Inc., is designed specifically for high-speed, production-type earth boring.

According to the manufacturer, it provides the capacity, operating ease, and endurance required for fast down-the-line erection of power lines, guardrails, fences, and similar installations. In addition, the Apache accommodates reaming and belling tools to 60 inches in diameter and drives 4½-inch-diameter augers to 75 feet. Responsive, full-hydraulic feed, tilt, and angle controls reduce operator fatigue.

Lightweight and self-powered, the Apache can be quickly mounted on or demounted from a truck bed or chassis. A power-takeoff model is available for truck mounting or for mounting on the rear of any popular make of crawler-tread tractor. Optional equipment includes pole setter and winch, turntable, and wiggletail.

For further information write to Mobile Drilling, Inc., Dept. C&E, 960 N. Pennsylvania St., Indianapolis, Ind., or use the Request Card at page 18. Circle No. 34.

On the Apache, the drill head tilts four ways for angle boring or vertical boring on slopes.



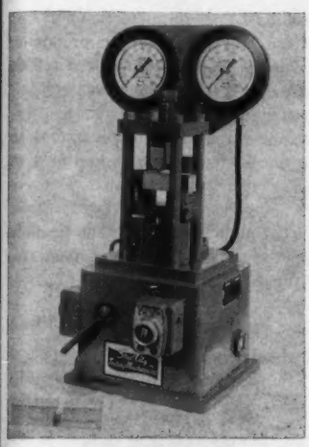

HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA
For more facts, use Request Card at page 18 and circle No. 295

## Transverse tester for concrete specimens

Transverse testing machines for determining the flexural strength of concrete specimens are now available from Steel City Testing Machines, Inc.

Designated Model TF-179, the bench-mounted testers have a capacity of 2,000 pounds. They apply a uniform load at a preset rate, which can be varied to suit requirements.

These testing machines are hydraulically operated, with the hydraulic system located within the base, and are powered by 1/6-hp motors operating on 110-volt 60-cycle ac. Controls are located on the front of the base for ease of operation. A flow-control and check valve, with vernier-graduated dial, is provided for presetting the load rate, and a directional valve is provided for controlling vertical movements. Twin gages are mounted on the testers for increased sensitivity, one gage being graduated from 0 to 600 pounds and the other, from 0 to 2,000 pounds.



The testers have an over-all height of 31 inches, a depth of 23 inches, and a width of 16 inches.

For further information write to Steel City Testing Machines, Inc., Dept. C&E, 8817 Lyndon Ave., Detroit 38, Mich., or use the Request Card at page 18. Circle No. 92.

## Rubber conveyor belt for extra-heavy duty

A new woven-carcass extra-heavy-duty rubber conveyor belt, called Industrial Uniflo, is announced by The Goodyear Tire & Rubber Co.

Thousands of rubber rivets penetrate deep into the woven carcass to insure maximum cover adhesion, the manufacturer reports, adding that without the use of a breaker the belt offers unusual resistance to cover separation, even under severe usage.

Built-in impact resistance, excellent fastener holding qualities, outstanding troughing and tracking properties, and better resistance to edge wear are reported benefits.

For further information write to The Goodyear Tire & Rubber Co., Dept. C&E, 1144 E. Market, Akron 16, Ohio, or use the Request Card at page 18. Circle No. 7.

Versatility and comfort are highlighted in Ford's 1961 trucks. The extra-heavy-duty T-850 pictured here features separate mounting of front-end sheet metal and fenders, cab, and radiator for reduced vibration plus greater durability. The cab is shortened nearly 10 inches, new springs last longer and ride better, frames are tougher and wheelbases longer. Power is supplied by Ford's Super Duty V-8 engines, ranging from 206 to 266 horsepower. Maximum gvw of the T-850 is 45,000 pounds. For further information write to the **Ford Motor Co.**, Ford Division, Dept. C&E, P. O. Box 608, Dearborn, Mich., or use the Request Card at page 18. Circle No. 43.

# Vibrating shoes consolidate fast, deep for profitable single-course construction!

100% consolidation of subbase materials is often possible in only one pass with a Lima Roadpacker. High-speed vibrating action fills voids, keying materials to depths of 12 in. and more.

**Fewer courses, passes**

Single-course construction with a Roadpacker is more profitable, because you need lay fewer courses and make fewer passes than with less efficient consolidation equipment.

Working widths can be varied up to 13 ft., 1 in. End shoes fold up for highway travel at speeds to 30 mph. Roadpacker works at speeds from 20 to 95 fpm; consolidates up to 600 tons per hour. Works forward or in reverse, never shoves material. Self-propelled; gasoline or diesel engine. Easy to operate; good visibility. Optional widener attachment is available to replace trench rollers.

Lima Roadpackers are easy to maintain. Hydraulically operated vibratory shoe mechanisms are completely sealed from abrasive dust; maintenance free.

**Super model available**

Lima also offers a new 12-shoe *Super* Roadpacker for extra-high-production consolidation on large construction jobs such as superhighways, air bases and earth-fill dams. It has more than double the consolidating capacity of any multiple shoe vibratory machine!

Learn more about the profit-making features of Lima Roadpackers. See your nearby Lima distributor today or write to Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

*MODEL D ROADPACKER*—International favorite for high-speed, high-production consolidation on highway and airport construction.

*NEW 5-YD. LIMA LOADER* digs, scoops, swings and loads from stationary position; no waste motion. Fast, economical way to handle bulk materials.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

**LIMA** Construction Equipment Division, Lima, Ohio

**BALDWIN · LIMA · HAMILTON** 6024

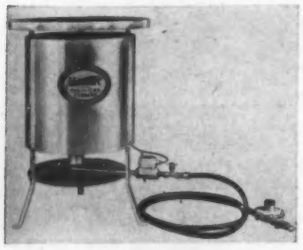
Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment

For more facts, use Request Card at page 18 and circle No. 296

## New salamander burns LP gas, butane, propane

A new gas-burning portable salamander, designated Little Giant, is offered by the Hauck Mfg. Co.

With a standard capacity of 50,000 Btu, the salamander is said to quickly radiate, circulate, and spread heat over a wide area by means of a heat-equalizing baffle and distributor shield.



The salamander burns LP gas, butane, or propane. Lighting is instant. In the event of flame failure, shut-off of gas supply is automatic. The vapor gas burner has a clean-out plug, simplifying maintenance.

The unit is of all-steel construction for strength and durability, and has a net weight of 22 pounds.

For further information write to the Hauck Mfg. Co., Dept. C&E, 126 Tenth St., Brooklyn, N. Y., or use the Request Card that is bound in at page 18. Circle No. 8.

The new Trac-Paver is shown here paving a 4-foot-wide bituminous gutter with a 6-inch concave.

## Bituminous paver handles varied-shaped profiles

The Trac-Machinery Corp. announces a new contour Trac-Paver for narrow-gage bituminous paving of varying profiles.

This Trac-Paver has a 5,000-pound hopper, and is conveyor-fed from the hopper to distributing screws in front of the screed.

The screed has a hydraulically driven vibrator that develops 3,000 pounds of force (at 2,000 rpm) to the form section of the screed for compaction. The form section of the screed is replaceable for producing variously shaped profiles. The screed is heated by LP-gas burners.

Standard equipment includes a hydraulic variable-speed winch (2½ to 20 fpm) for propulsion when paving.

For further information write to the Trac-Machinery Corp., Dept. C&E, Nunda, N. Y., or use the Request Card that is bound in at page 18. Circle No. 97.

## Safety-hat liners have no-metal design

Six new safety-hat winter liners are available from Jackson Products.

Offered in a wide range of styles, the liners are said to fit all hats. They feature lightweight durable materials for warmth and easy washing. The metal-free design of the Jackson liners permits their use by workers exposed to electrical-shock hazards.

For further information write to Jackson Products, Air Reduction Sales Co., Dept. C&E, 31739 Mound Road, Warren, Mich., or use the Request Card that is bound in at page 18. Circle No. 31.

# cut your cleaning time 80%

# with MALSBARY HPC*

*HYDRAULIC PRESSURE COMBINATION cleaner, the power-packed machine that gives you, the user, 5 times greater cleaning ability than a conventional steam vapor cleaner. Only HPC produces the explosive 300-400 psi and uniform solution pattern needed to effectively blast away caked mud, grease, road oils, old paint, ice deposits. This efficient cleaning force comes from combining thermal and hydraulic pump-produced pressures—a Malsbary patented device. With HPC you do as much work in 1½ hours as you can do with a steam cleaner in 8 hours!

You have the task of maintaining big equipment... keeping it on the move and producing... you know saving downtime is the same as saving money. Join more than 6000 others now profiting with Malsbary HPC. Fill in the coupon today, and let us show you how HPC gets the job done—fast and satisfactorily. No obligation ...and there's money in it for both of us.

MALSBARY

Malsbary Manufacturing Co. • 845 - 92nd Ave., Oakland 3, Calif.

Malsbary Manufacturing Co. 149
845 - 92nd Ave., Oakland 3, Calif.

Please send me ☐ folder on Malsbary HPC cleaners; ☐ information on buy-and-try plan.

Name_____ Position_____

Company_____

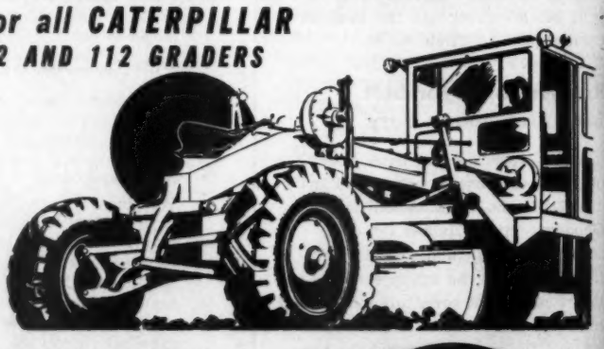
Address_____

For more facts, use coupon or Request Card at page 18 and circle No. 297



# POWER STEERING

for all CATERPILLAR 12 AND 112 GRADERS



EASY ONE-DAY INSTALLATION

Not a booster unit . . . but heavy-duty, full-time hydraulic power steering that speeds work, cuts accidents and eases strain on machine and operator. Simplified design permits easy installation and maintenance.

Simplified Design
Sheppard POWER STEERING
Only 4 Moving Parts

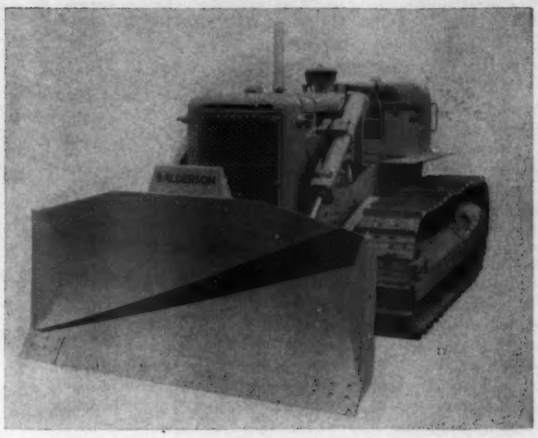
Get the facts at your CATERPILLAR Distributor or write:

R. H. SHEPPARD CO., INC. • HANOVER, PA.

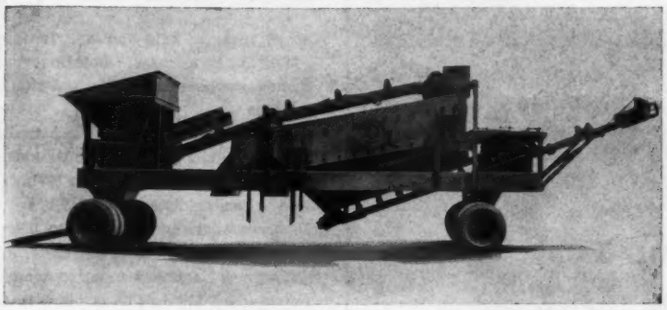
Sheppard Power Steering is original equipment on many models of Brockway and Mack Trucks, Koehring Dumpsters, Allis-Chalmers Graders, Huber Warco Maintainers and many others.

For more facts, use Request Card at page 18 and circle No. 298

**For dozing jobs requiring a minimum-width blade,** Balderson, Inc., has available a new main-frame-mounted inside dozer for the Cat D6B tractor. The Model BD16's standard blade has vertical cutting edges on the end plates; it is 8 feet wide for legal and safe transportability. Push arms of the BD16 dozer extend between the tracks and the tractor engine, attaching to Cat ball-type trunnions that are welded to heavy steel brackets. These trunnion brackets bolt on each side of the main frame of the tractor to give plenty of raise and dig for both cable and hydraulically controlled blades. The tracks are free to oscillate while the blade stays level with the tractor. For further information write to **Balderson, Inc.,** Dept. C&E, Wamego, Kans., or use the Request Card at page 18. Circle No. 2.



## Portable screening plant has unitized design



The standard Pioneer Model 522-E.

A new, portable screening plant, the Model 522-E, has been announced by Pioneer Engineering.

This plant incorporates a high-speed, 2-bearing, 2-deck (5 × 14-foot top deck) screen with spouting that allows material retained on the two decks to be combined or discharged separately.

Standard equipment includes a mechanical feeder, 30-inch feed conveyor, 30-inch end delivery conveyor, and 24-inch side delivery conveyor.

All units are combined on a single chassis with single rear axle and fifth-wheel front pin or front bolster. The axle can be mounted on either end.

The Model 522-E uses electric motor drives, but can also be equipped with gasoline or diesel power.

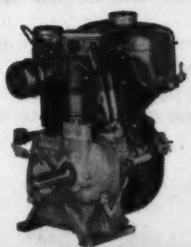
Other models are also available.

For further information write to Pioneer Engineering, division of Poor & Co., Inc., Dept. C&E, 3200 Como Ave. S.E., Minneapolis 14, Minn., or use the Request Card at page 18. Circle No. 108.

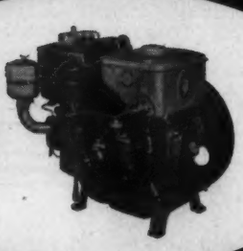

BIG JOB... SMALL ENGINE?

YANMAR

DIESEL DOES IT!



SAFE
COMPACT
DEPENDABLE
VERSATILE



4 Cycle — AIR-COOLED Single Cyl. 2 to 4½ BHP 2000-3000 RPM. LIGHT WEIGHT — EASY STARTING. Especially recommended for PORTABLE & EMERGENCY EQUIPMENT

A Precision Product of the New Japan. Made to U.S. specifications by The world's largest manufacturer of small diesels. COMPLETE ACCESSORY LINE. All engines and parts stocked in the U.S.A.

4 Cycle — WATER-COOLED Single Cyl. 2 to 8 BHP in 2000 RPM range. COMPLETELY SELF-CONTAINED. Easy starting, smooth running for GENERAL PURPOSE APPLICATIONS

*for literature and dealer information write:*

YANMAR

CONTINENTAL MACHINERY CORP.

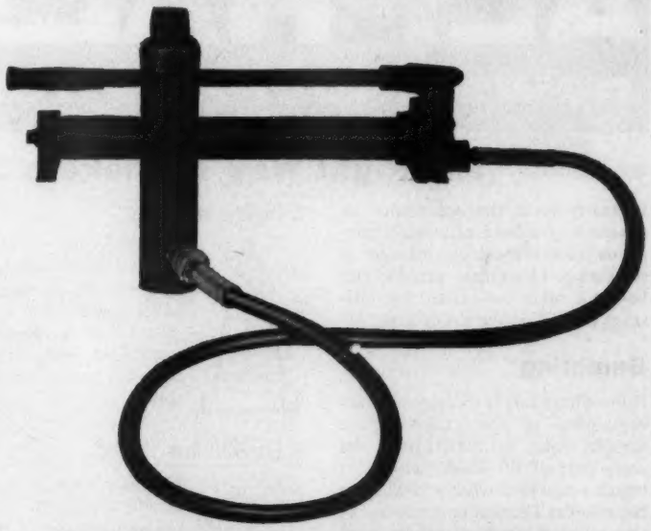
19402 So. Susana Rd., Compton, Calif.

Mailing Address: P. O. Box 5309, Long Beach 5, California

For more facts, use Request Card at page 18 and circle No. 299



VERSATILE POWER PACKAGE



DUFF-NORTON
RAM-PAC®
HYDRAULIC RAMS AND PUMPS

The Duff-Norton Ram-Pac line provides a versatile source of power to apply from 10 to 100 tons of force in any direction—with little effort.

The twelve rams may be used with the hand or power pumps as portable sources of power for adjusting, testing, bending—pulling gears, sleeves and cylinder linings—pushing pipe or culvert—for heavy moving and lifting. They also are used for permanent installation in hydraulic jigs, fixtures and presses.

The five pumps include two hand pumps, an air-hydraulic pump, an electric pump and a gasoline powered pump. Attachment units, accessories and fittings further increase the versatility of the line. For description and specifications ask your distributor or write for Bulletin AD-90.

DUFF-NORTON JACKS

Four Gateway Center • Pittsburgh 22, Pa.

DUFF-NORTON JACKS
Ratchet • Screw
Hydraulic • Worm Gear

DUFF-NORTON

COFFING HOISTS
Ratchet Lever • Air
Hand Chain • Electric

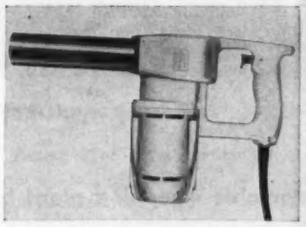
For more facts, use Request Card at page 18 and circle No. 300

**This new 40 × 36 single-impeller impactor, offered by Lippmann Engineering Works, Inc., features double-reversible rotor hammers. They can be reversed 180 degrees, as well as end-over-end, to give four wearing edges in place of the customary two. Recommended power plant for the machine is 150 horsepower. Operating speed range extends from a low of 425 to a high of 725 rpm. Grates are offered with choice of space-openings ranging from 2 to 5 inches, in ½-inch increments. The new design is also available in 45 × 48-inch size, and as a stationary, skid-mounted, or portable unit. For further information write to the Lippmann Engineering Works, Inc., Dept. C&E, 4603 W. Mitchell St., Milwaukee, Wis., or use the Request Card at page 18. Circle No. 47.**

## New power hammer speeds drilling, chipping work

A new electric power hammer offered by the Ingersoll-Rand Co. features greater durability, less maintenance, and faster operation than its predecessor.

The Model H541U delivers about 2,500 blows per minute for roughing and breaking up concrete; chipping



scale, rust, or weld spatter; driving self-drilling anchors; pointing up stonework; peening rivets; and similar jobs.

The hammer weighs 12¾ pounds with the cable. It is 15¾ inches long, 8 13/16 inches high, and has a ⅞-inch side-to-center distance at the barrel. It accommodates drills up to 1⅛-inch-diameter hole size.

The new hammer's motor operates on standard 115-volt ac or dc, with a motor rating of 5.0 amp. A 230-volt motor with a 2.5 amp rating can be furnished.

For further information write to the Ingersoll-Rand Co., Dept. C&E, 11 Broadway, New York 4, N. Y., or use the Request Card at page 18. Circle No. 103.

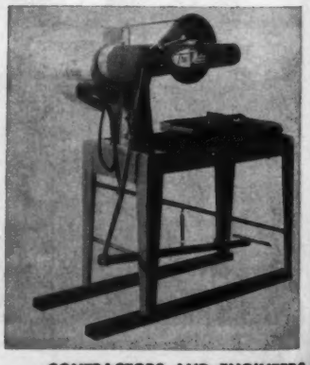
## Masonry saw boasts automatic features

Engineered Equipment, Inc., announces a new Tru-Matic masonry saw.

Features include a self-positioning blade guard that is always parallel to the conveyor cart regardless of head-height adjustment, whether jam cutting or step cutting. The saw also features instantaneous height adjustment and true alignment to assure precision cutting.

An optional longitudinal track on which the conveyor cart can carry material for accurate long cuts is available.

For further information write to Engineered Equipment, Inc., Dept. C&E, Box 726, Waterloo, Iowa, or use the Request Card at page 18. Circle No. 16.




# ALPHA

**BETTER CONSTRUCTION THROUGH BETTER USE OF CEMENTS**

## news and notes from the field

## The Right Way To Make a Slump Test

In many cases the acceptance or rejection of a load of concrete depends upon a one-inch variation in the slump. This much variation can be—and often is—caused by mistakes in making the slump test.

### Sampling

If the slump test is to determine acceptability of the concrete, the sample must be taken from the early part of the load. Let out at least a wheelbarrowful before taking the sample. The first concrete out of the mixer should never be used for testing.

If the test is to be representative of the entire load, take samples from three parts of the load, directly from the mixer discharge. The total sample should be at least 80 lbs. and should be remixed in wheelbarrow before making slump.

**1. Place Slump Cone on Plank, Slab or Steel Plate**

Moisten the inside of the cone and place it on a flat, level, firm surface which extends several inches beyond the base of the cone. When putting concrete in the cone stand on the foot lugs to hold it firmly in place.

**2. Fill Cone in 3 Layers**

Fill the cone ⅓ full and rod layer exactly 25 times with a round, bullet-nosed iron or steel rod of ⅝" diameter. Rod uniformly over the entire concrete layer.

**3. Use Bullet-Nose ⅝" Rod**

Fill the cone with the second layer until ⅔ full and rod this layer 25 times uniformly over the entire concrete surface, penetrating into but not through the first or bottom layer.

**4. Rod Each Layer 25 Times Uniformly**

Fill the cone until it slightly overflows and then rod this top layer 25 times uniformly, penetrating into but not through the second layer.

**5. Strike Off Excess Concrete**

Strike off excess concrete from the top with a straightedge so that the cone is exactly full. Remove spilled concrete from around the bottom of the cone.

**6. Remove Cone Carefully**

Lift cone straight up, slowly and gently, immediately after filling, rodding and strike-off are completed. Never jar the concrete at this point.

**7. Measure Slump From Bottom of Straightedge**

Measure the slump as shown above. If the top of the slump is irregular, do not measure the high point or the low point. Try to get the average. Caution: Never reuse this concrete for cylinder strength tests.

**Recommended Slumps for Various Types of Construction***

| Type of Construction | Slump inches** | |
|---|---|---|
| | Maximum | Minimum |
| Reinforced foundation walls and footings, and thin plain walls | 5 | 2 |
| Plain footings, caissons, and substructure walls | 4 | 1 |
| Slabs, beams, and reinforced walls | 6 | 3 |
| Building columns | 6 | 3 |
| Pavements | 3 | 2 |
| Heavy mass construction | 3 | 1 |

*Adapted from Table 4 of the 1940 Joint Committee "Report on Recommended Practice and Standard Specifications for Concrete and Reinforced Concrete."

**When high-frequency vibrators are used, the values given should be reduced about one-third.

*Reprints of the information on this page are available for the asking.*

ALPHA
PORTLAND CEMENT COMPANY
Alpha Building, Easton, Pa.

For more facts, use Request Card at page 18 and circle No. 301

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## Automatic control system for dryer burner units

The Iowa Mfg. Co. has announced a new automatic dryer-burner control system for use with asphalt-plant dryer units when close temperature control of dried aggregate is desired.

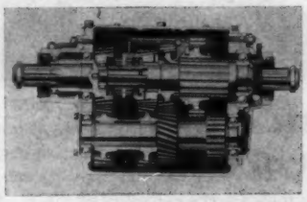
This system consists of three units, each representing one phase of the control. Model BCU-1 is the burner control unit, which transfers the control of the dryer burner to the plant platform. Model TRCU-2 is the temperature recording and controlling unit, which works with the burner control unit to automatically control the temperature of the dried aggregates. Model BRCU-1 is the burner remote-control unit, which is designed to work with the other two units for starting and stopping the burner from some location other than the operator's platform.

The three self-contained units are completely housed in weathertight enclosures, and all adjustments can be made by the operator by simple switch and dial controls. Operation of the automatic dryer-burner control is flexible, since the control system can be either automatic or manual as the operator desires. Choice of semi-automatic, automatic, or remote automatic operation is made by positioning the selector. Other settings necessary for each type of operation can easily be made by the mixing-plant operator while the plant is in operation, thus assuring continuous production.

For further information write to the Iowa Mfg. Co., Dept. C&E, 916 16th St. N.E., Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 74.

## Auxiliary transmissions for trucks and tractors

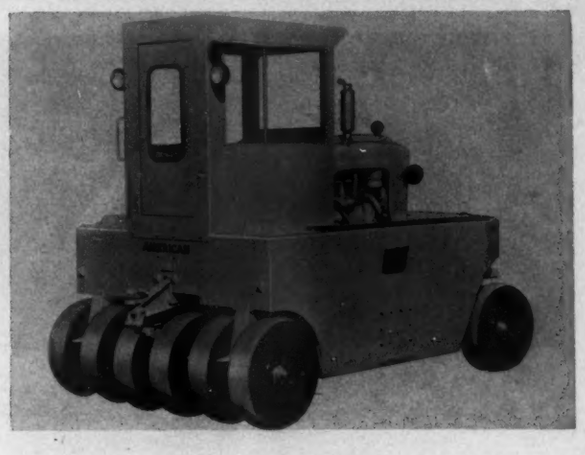
Two new 4-speed auxiliary transmissions for medium and heavy-duty trucks and tractors have been announced by the Fuller Mfg. Co., Kalamazoo, Mich.



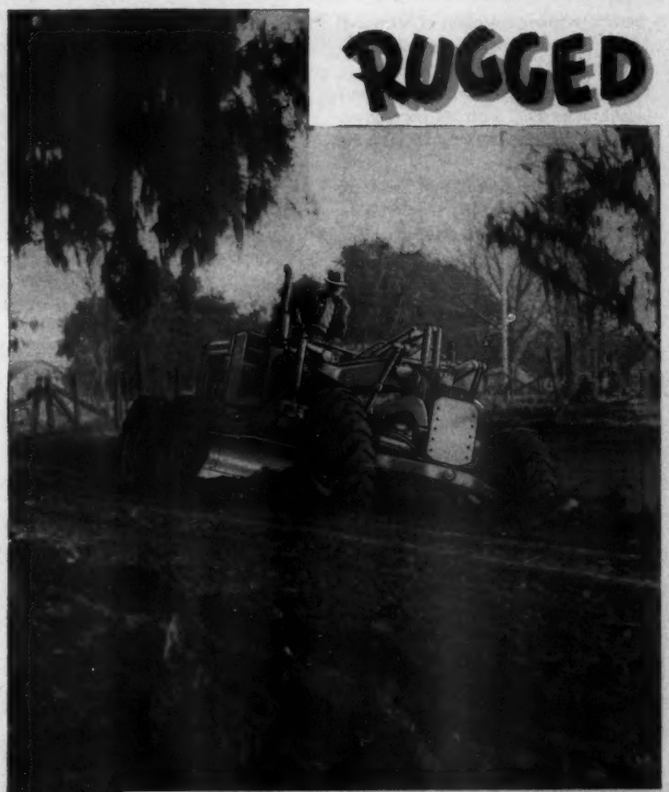
The Fuller Model 4-B-73 and 4-B-75 auxiliaries, with overdrive, direct, low, and low-low in one compact, 375-pound unit, provide gear-splitting ratios, plus deep reduction.

The Fuller 4-B-73 is designed for use with engines producing approximately 500 to 600 pound-feet of torque. Use of special high-capacity bearings permits the 4-B-75 to be used with engines in the 600 to 700-pound-foot torque class.

For further information write to the Fuller Mfg. Co., Transmission Division, Dept. C&E, Kalamazoo, Mich., or use the Request Card at page 18. Circle No. 5.



An all-weather enclosed cab for the Model 11 WG Road Runner is available from the American Steel Works. The cab unit features a 20,000-Btu heater and defroster, windshield wipers, and large safety plate-glass windows for all-round visibility. Side windows slide open for ventilation. According to the manufacturer, the cab can be easily installed or removed by two men in little over an hour. For further information write to the **American Steel Works**, Dept. C&E, 1211 W. 27th St., Kansas City, Mo., or use the Request Card at page 18. Circle No. 76.

RUGGED JOBS-
*demand a*
RUGGED GRADER...

This GALION Model 160 Motor Grader demonstrated its ruggedness on state project 400-04-04, St. Martinville-Parks, Louisiana, on January 10, 1959.

The contractor bought it after seeing this demonstration, and reported on October 8, 1959, "The job is now complete. This grader has been used on three other projects with the same satisfying results. There has been no down time due to repairs."

GALION Model 160 is an Extra Heavy Duty Motor Grader with 160 hp Cummins Diesel Engine, constant mesh transmission and full hydraulic controls. Its weight is 30,020 lbs. with scarifier.

Write now for complete specifications on this outstanding heavy duty profit maker for rugged jobs—or any grader jobs. It has an extra width, extra length Hydraulic Shiftable Moldboard as standard equipment, and the exclusive Hydra-Tilt Moldboard is available for varying the pitch hydraulically from the operator's platform — ideal for mix-in-place and material spreading jobs.

THE GALION IRON WORKS & MFG. COMPANY
General and Export Offices
Galion, Ohio, U.S.A.
Cable Address—GALIONIRON, Galion, Ohio

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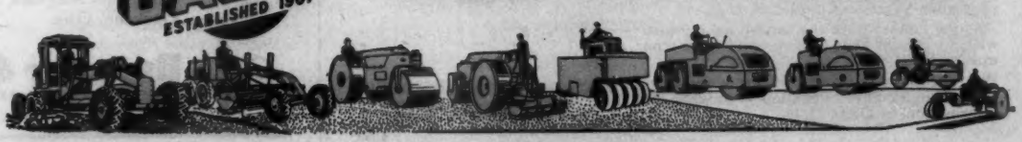
MOTOR GRADERS & ROLLERS
VIBRATORY COMPACTORS • PNEUMATIC TIRE ROLLERS



For more facts, use Request Card at page 18 and circle No. 302

Designed for hauling smaller equipment, the Talbert TD-6 is rated at 6-ton load capacity on a 7-ton spring and walking-beam suspension.

## New utility trailer has 6-ton capacity

Talbert Trailers, Inc., has introduced a new utility trailer, the Model TD-6.

The unit features a 6-ton rated load capacity on a 14,000-pound spring and walking-beam suspension. Standard features include full-width tubular axles with electric brakes on both axles, 14-foot × 6-foot, 5-inch deck, 20-inch loaded deck height, skid boards, and an emergency breakaway switch equipped with 6-volt battery.

For further information write to Talbert Trailers, Inc., Dept. C&E, 7950 W. 47th St., Lyons, Ill., or use the Request Card at page 18. Circle No. 13.

## Announce improvements for tractor shovel

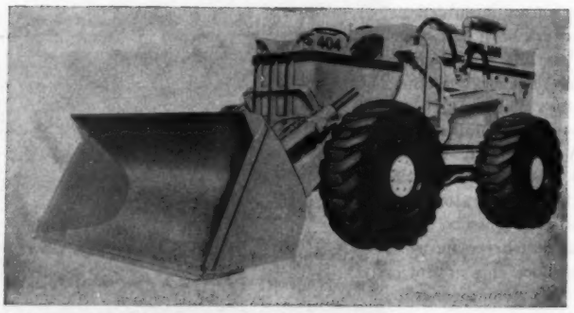
The Trojan Division of The Yale & Towne Mfg. Co. offers its new, improved Model 404 tractor shovel.

Among improvements are: new engine options with greater horsepower, longer wheelbase for increased stability, a newly designed filtered hydraulic system incorporating an advanced type of low-heat generating pump, new main-boom hydraulic lift cylinders with longer-lived packing and armored 3-wire hydraulic hoses.

Tire options have been increased to permit a wider selection of sizes and types to better match ground conditions.

Power is supplied by either the General Motors 8V71 with 264 horsepower or the Cummins NH 250 developing 250 horsepower.

For further information write to the Trojan Division, The Yale & Towne Mfg. Co., Dept. C&E, Main St., Batavia, N. Y., or use the Request Card that is bound in at page 18. Circle No. 14.



Refinements of the Trojan Model 404 were designed to increase its utility on round-the-clock production jobs.

*You'll never burn out a Wisconsin Engine through overheating — by either chance or neglect!*

The Wisconsin high-temperature safety switch *automatically* stops the engine before danger occurs. Frequent stops mean that your engine needs routine care. And stopping goes on until proper care is given.

Anyone can install the switch in minutes without special tools or skill. And there's no upkeep involved.

Pick one up at your nearby Authorized Wisconsin Engine Service Station — or write for information to Dept. C-20.

WISCONSIN
MOTOR CORPORATION
MILWAUKEE 46, WISCONSIN
*World's Largest Builders of Heavy-Duty Air-Cooled Engines*

C-366

For more facts, use Request Card at page 18 and circle No. 303

***with* BRUNNER & LAY**
**Rok-Bits and drill steel**

Brunner & Lay rock drilling tools are the mainstay of contractors who must keep up fast, uninterrupted drilling. They produce ROUND, easily-loaded blast holes. Provide better and bigger chip clearance, to keep hole cleaning operations at a minimum. The job-fitted carbides stay put to give big daily footage, at lowest cost. Proved on every type job, and machine.

Check your present tools against them. Call our local dealer, or nearest plant—request catalog #759.

Brunner & Lay, Inc., 9300 King St., Franklin Park, Ill. *Est. 1882.* Plants & conversion shops: Albuquerque, Asheville, Birmingham, Dallas, Long Island City, Los Angeles, Philadelphia, Sacramento, Seattle, Lachine, Que.

**Brunner & Lay** carbide ROK-BITS • DRILL RODS
INTRASET STEEL • COUPLINGS, ADAPTERS, SECTIONAL STEEL, STRIKING BARS • Standard or ROPE thread • MOIL POINTS, CLAY SPADES, ASPHALT CUTTERS, etc.

For more facts, use Request Card at page 18 and circle No. 304

## Material-handling crane offers 5-ton capacity

A new all-hydraulic rubber-tire material-handling crane of 10,000-pound capacity is announced by The Hanson Clutch & Machinery Co.

Designated Model H-5, the crane is powered by a Model F-226 Continental 6-cylinder gasoline engine with a transmission offering four speeds forward and one in reverse, and an Allison torque-converter drive as standard equipment. The boom swings in a 360-degree arc and telescopes hydraulically from its 10-foot basic length to an extended length of 18 feet. All operations are independent and simultaneous.

Tires are 9.00 × 20, 10-ply with dual wheels on the front drive axle and single wheels on the rear steering axle. The crane, which travels at speeds to 20 mph, has 4-wheel hydraulic brakes and hydraulic power steering.

For further information write to The Hanson Clutch & Machinery Co., Dept. C&E, 2000 Miami St., Tiffin, Ohio, or use the Request Card at page 18. Circle No. 32.

Powered by a Continental gasoline engine, the Hanson Model H-5 travels at speeds up to 20 mph.

## Portable drilling rig for holes to 4 inches

The New England Carbide Tool Co., Inc., offers a portable drilling machine for drilling holes from 1½ up to 4 inches in diameter in reinforced concrete or any type of masonry. Using either the firm's Cyclo-Core or new thin-wall carbide-tipped masonry bits, the Model 440 will drill dry and dustless or wet, quickly and efficiently.

The unit drills either horizontally or vertically; close to walls or in corners; is easily portable; and requires only one man to operate it. The standard telescoping jack post is mounted on a base plate that allows a minimum height of 8 feet and a maximum of 13 feet.

Power is supplied by a 1½-hp totally enclosed motor with heavy-duty gear reduction.

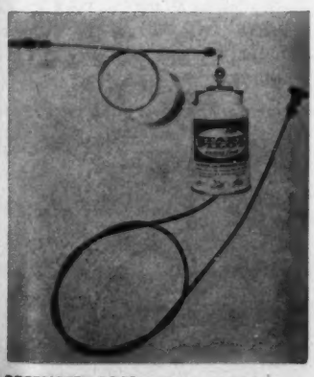
For further information write to the New England Carbide Tool Co., Inc., Dept. C&E, 55 S. Commercial St., Medford 55, Mass., or use the Request Card at page 18. Circle No. 107.

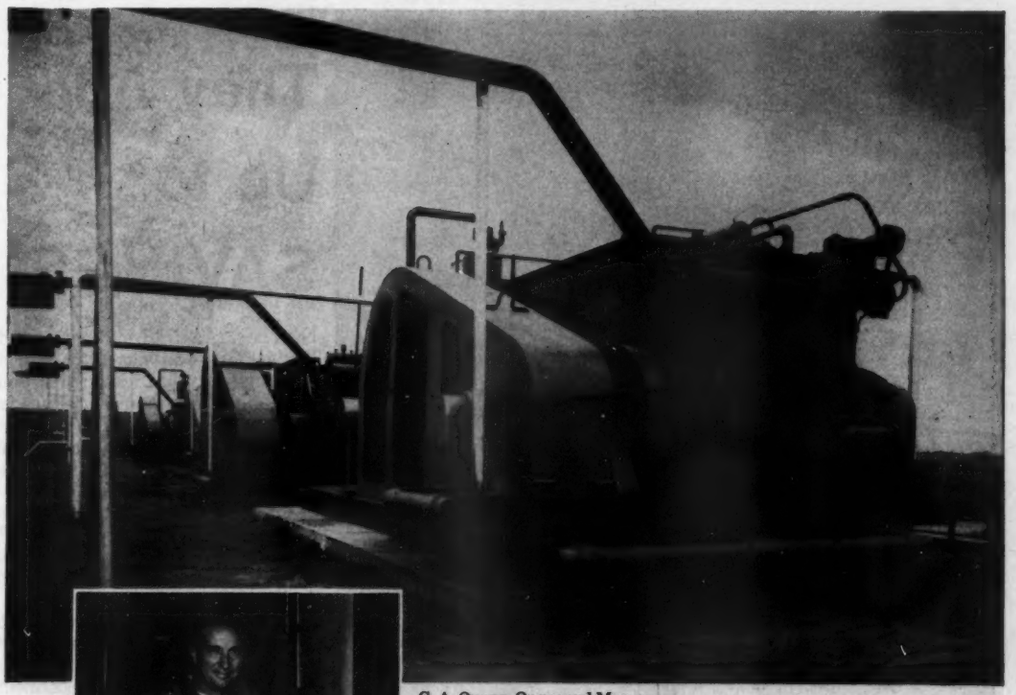
## Aerosol-can primer for winter starting

The Start Pilot Corp. has available an aerosol-can primer that reportedly can be used with all brands of aerosol-can starting fluids, and can be installed on the instrument panel or under the hood. It is designated Model 1200.

With the installation of this engine primer, the starting of the engine is done from the operator's position.

For further information write to the Start Pilot Corp., Dept. C&E, 61 Second St., Mineola, N. Y., or use the card at page 18. Circle No. 62.



C. A. Owens, Owner and Manager
Industrial & Marine Service Co.,
Houston, Texas

Clevite 77

**Keeps natural gas flowing... NATURALLY!**

C. A. Owens, one of the Southwest's leading engine rebuilders who services several of the large oil companies, is shown with one of the engines at the Vienna Field, Texas, pumping station owned by Christie, Mitchell & Mitchell. Mr. Owens has this to say:

"Any owner of a high-speed engine that is operating under continuous and heavy loads must have assurance that down-time will be cut to a minimum. An engine that is down isn't making money, whether it be in a pumping station such as this, or on any type job. You've got to use an engine bearing that can take it. We depend upon CLEVITE 77 to do the job—and it does."

CLEVITE 77 (the bearing preferred by O.E.M.) with patented cast copper lead tri-metal construction provides greater load carrying capacity and longer life.

CLEVITE ALUMINUM BEARINGS: A full line of Steel Backed and Solid Aluminum bearings (identical to original equipment) is available for ALL special earthmoving equipment. A complete range of undersizes gives you up to four regrinds, extending crankshaft life.

Complete coverage, availability and fast service from your NAPA Jobber make it easy to use the best from the world's leading original equipment manufacturer—CLEVITE.

**MONMOUTH *Engine Bearings***

CLEVITE SERVICE: Cleveland Graphite Bronze • Division of Clevite Corporation • Cleveland 3, Ohio

For more facts, use Request Card at page 18 and circle No. 305

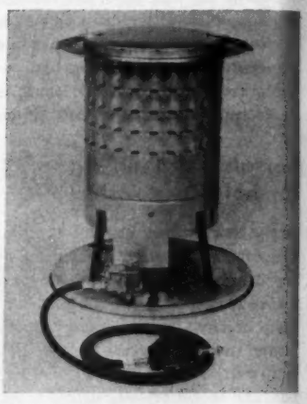
**Designed to speed up cold-weather work,** the Master B-125 space heater can be used on scaffolds for outside masonry work under tarps, for maintenance work, for temporary heat in shelters, and for any spot heating job outside. The 125,000-Btu-capacity unit plugs into any 115-volt ac outlet, and runs on kerosene, or No. 1 or 2 fuel oil. For further information write to the **Master Vibrator Co.,** Dept. C&E, 365 Stanley Ave., Dayton 1, Ohio, or use the Request Card at page 18. Circle No. 63.

## LP-gas space heater produces 85,000 Btu

A new LP-gas space heater is offered by C. R. Daniels, Inc.

Called Penguin, this heater releases over 85,000 Btu of radiant heat close to the ground without the need for separate floor protectors, states the manufacturer. Alloy-clad steel shells give maximum resistance to corrosion.

Two models are available. The safety-control model includes a



safety pilot light and shutoff valve, LP-gas regulator, and 7 feet of hose. The manual-control model is easily ignited by a match, but must be turned on and off manually; an LP-gas regulator and a 7-foot hose are included.

For further information write to C. R. Daniels, Inc., Dept. C&E, Daniels, Md., or use the Request Card at page 18. Circle No. 4.

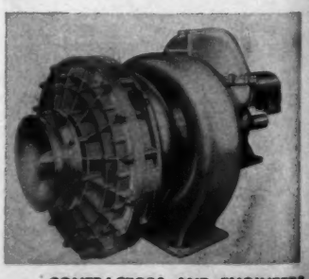
## Offer new gas turbine for off-highway vehicles

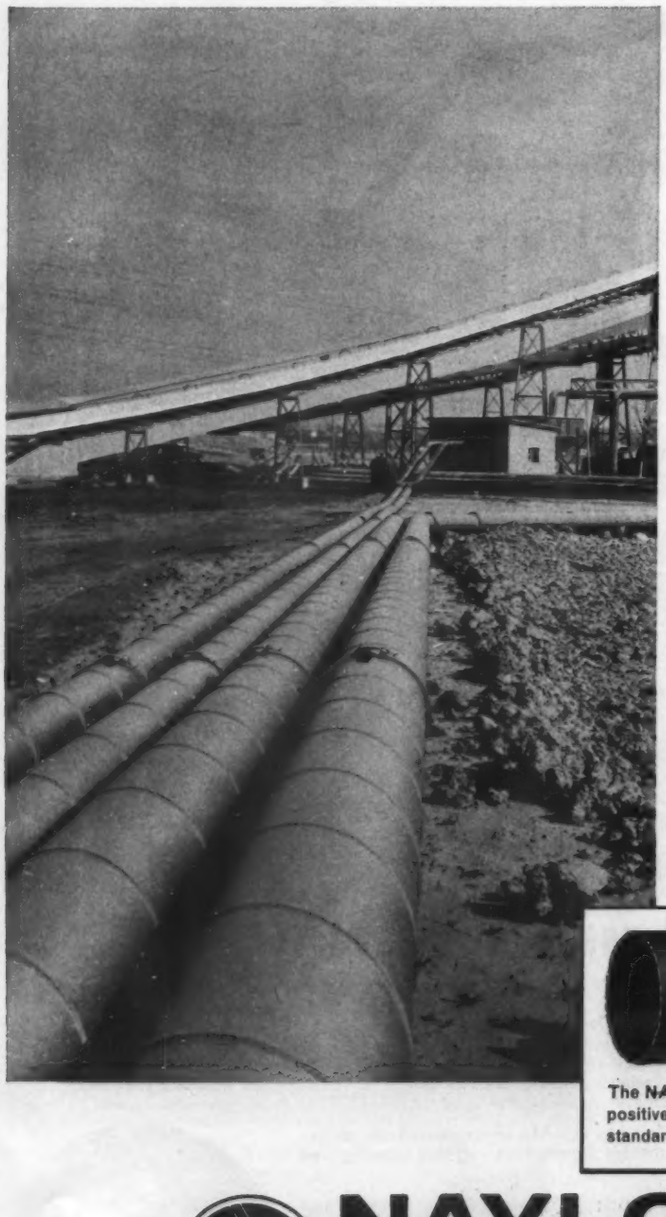
The Waukesha Motor Co. offers a new industrial-type gas turbine.

Designed to develop 400 horsepower, it incorporates a centrifugal compressor, annular combustor, 2-stage turbine section, and integral speed-reducing gear case. The unit is a free-shaft engine, said to provide ideal high-torque characteristics for truck and off-the-road vehicle applications, and can be converted to a fixed-shaft version for alternator drive and other constant-speed applications.

The 400-hp rating can be provided at output shaft speeds of 2,500 or 3,600 rpm, with the free-shaft feature providing very high torque at zero rpm.

For further information write to the Waukesha Motor Co., Dept. C&E, Waukesha, Wis., or use the Request Card that is bound in at page 18. Circle No. 78.



# They Add Up to SAVINGS!

NAYLOR Spiralweld pipe and Wedgelock couplings offer you a combination that can save you time, work and money on lines in construction service.

Any way you look at it, the light weight of NAYLOR pipe makes for easier handling . . . faster installation. And, thanks to the distinctive NAYLOR lockseamed-spiralwelded structure, there's no sacrifice of strength and safety in the line.

Wedgelock couplings contribute to savings by simplifying and speeding connections. A hammer is the only tool required to connect or disconnect them.

That's why it will pay you to consider the performance of this pipe and coupling combination for your lines in air, water and ventilating service.

***To get details, write for Bulletin No. 59 today!***

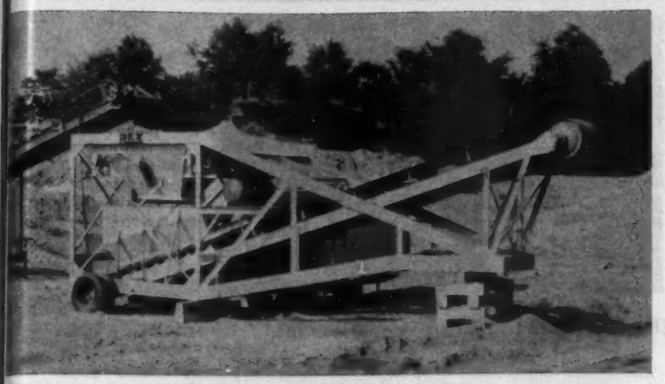
The NAYLOR Wedgelock coupling makes a positive connection, securely anchored in standard weight grooved ends.

**NAYLOR PIPE** *Company*

1270 East 92nd Street, Chicago 19, Illinois

Eastern U. S. and Foreign Sales Office: 60 East 42nd Street, New York 17, N. Y.

For more facts, use Request Card at page 18 and circle No. 306



The Rex Agg-Weigher is designed especially for sand and gravel operators supplying aggregate for road-paving operations.

## No stop at scale with new aggregate weigher

The new portable Rex Auto Agg-Weigher for fast, one-stop charging and weighing of aggregate has been announced by the Chain Belt Co.

According to the manufacturer, the unit provides accurate quantities without the use of a platform scale. It eliminates the stop at the scale and allows the truck operator to charge and weigh aggregate by merely pushing a button on the control panel. This control panel has digital presets for weighing exact amounts.

The automation is set to handle material on either a pound or ton basis and is designed for automatic recycling. The Agg-Weigher reportedly can weigh up to 720 tons of aggregates per hour.

For further information write to the Chain Belt Co., Dept. C&E, 4701 W. Greenfield Ave., Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 102.

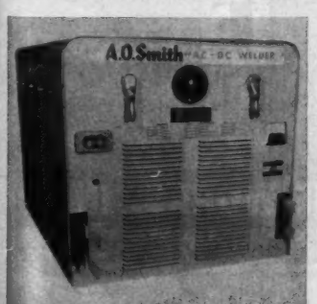
## Silicon rectifier welder is continuous-duty unit

An ac/dc silicon rectifier welding machine with a full 100 per cent duty cycle is announced by the A. O. Smith Corp.

Rated at 500 amp, the welder is said to be designed to replace 600-amp motor-generator sets on semiautomatic submerged-arc welding applications.

The ac section is suited for use with the heavy iron-powder electrodes. The dc side, in addition to its use on submerged-arc applications, can be used where hand arc dc welding is needed.

For further information write to the A. O. Smith Corp., Welding Products Division, Dept. C&E, 3533 N. 27th St., Milwaukee, Wis., or use the Request Card at page 18. Circle No. 93.

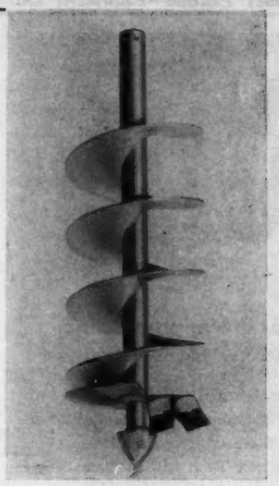



## Chain-saw drill assembly permits faster boring

New drive-on reversible Pengo "wisdom teeth" and shanks recently announced for chain-saw augers permit faster boring in harder soils.

Elimination of nuts and bolts also permits faster, easier replacement of worn parts. In addition, the quick-change reversible teeth afford ample clearance, which eliminates the wear of auger flighting.

For further information write to the Peterson Engineering Co., Inc., Dept. C&E, P. O. Box 330A, Santa Clara, Calif., or use the Request Card that is bound in at page 18 of this issue. Circle No. 81.




For Extra-Profit Loading...

Rip It First

PAVEMENT is shattered to easy-loading size with a single, fast pass with an ATECO ripper.

with an ATECO RIPPER

An ATECO Ripper on your loader pays off four ways:

**1. BIGGER LOADS, FASTER**...ripped material loads easier; you get heaped, extra-yardage loads in a hurry!

HINGE-AWAY shanks automatically retract when beam is raised, drop into ripping position when it is lowered. By inserting top shank pin, shanks can be held rigidly for ripping banks, in corners, etc.

**2. LESS WEAR AND TEAR ON YOUR LOADER** ...your ATECO ripper takes the beating, saves you costly loader downtime and repairs.

**3. IMPROVED PERFORMANCE**...rear ripper weight helps balance front loader, provides better traction, easier steering and handling—gives you a working counterweight!

**4. INCREASES WORK RANGE**...with an ATECO ripper, your loader can handle non-reinforced paving, hardpan, cemented gravel and other hard-to-load materials you couldn't load before!

ATECO rippers are designed and manufactured by the pioneer in the tractor-mounted ripper field. They have a 25-year record of outstanding performance on thousands of jobs the world over; why settle for less? Available now for all makes of crawler-mounted loaders; write for literature, prices. Please address Dept. 20.

American ATECO TRACTOR EQUIPMENT Corporation

Designers and Manufacturers Since 1920

OAKLAND 3, CALIF. 9131 SAN LEANDRO BOULEVARD • CHICAGO 38, ILL. 6541 65TH STREET

63

For more facts, use Request Card at page 18 and circle No. 307

### Expand equipment line with new transmissions

The Twin Disc Clutch Co. announces expansion of its line to include power-shift transmissions.

The new Twin Disc transmission is a 5-speed forward, 1-speed reverse unit, designed for engines developing up to 420 net horsepower at speeds up to 2,100 rpm. Designated Model TA-51-2001, it is a straight-through countershaft type with constant-mesh gearing and oil-cooled, hydraulically actuated clutches.

An 18-inch single-stage torque converter with freewheeled stator, hydraulic retarder, and lock-up clutch is also available. The converter and transmission can be furnished as a package unit or for independent transmission mounting.

For further information write to the Twin Disc Clutch Co., Dept. C&E, Racine, Wis., or use the Request Card at page 18. Circle No. 70.

The Hasselbalch U-16 sloper is equipped with an independent self-contained hydraulic system powered by the scarifier output shaft and quickly bolted to the motor-grader frame.

### Slope grader features hydraulic heel movement

The Grade-More Model U-16 slope grader with hydraulically controlled heel movement has been announced by Hasselbalch & Sons.

With a light touch on the hydraulic controls, the operator can move the heel of the 16-foot moldboard up and down, as well as in and out, from the side of the motor grader. He can make continuing adjustments, to fit constantly varying conditions, while the motor grader is in motion. Another hydraulic control moves the blade to the degree of slope required, with positive down pressure to assure a more perfect cut.

The new Grade-More can be used simultaneously with the motor-grader blade to provide a 24-inch blading width or to work on slope and top.

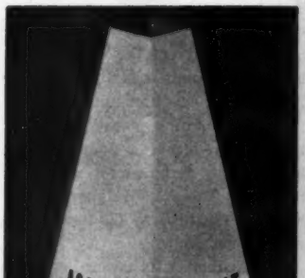
For further information write to Hasselbalch & Sons, Dept. C&E, 1112 Capitol Ave., Omaha, Nebr., or use the card at page 18. Circle No. 15.

### Offer throwaway marker for construction sites

A throwaway corrugated paperboard construction marker is offered by the Container Division of the St. Regis Paper Co.

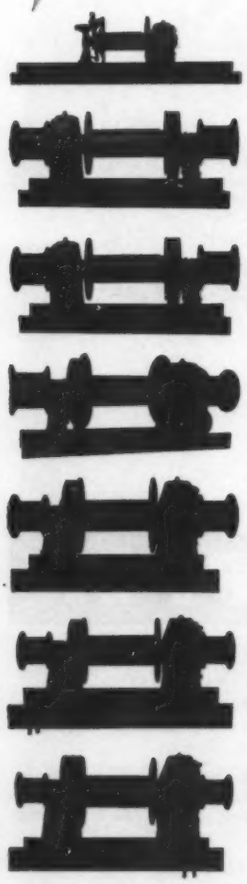
Called the Dispos-A-Marker, it is printed in vivid yellow for maximum visibility. The manufacturer points out that the marker's disposable feature eliminates the need for truck crews to return to the construction site to remove the markers after the job has been completed. Each marker carries an instruction line indicating the date it can be disposed of.

For further information write to the St. Regis Paper Co., Container Division, Dept. C&E, 150 E. 42nd St., New York 17, N. Y., or use the Request Card at page 18. Circle No. 40.





Check these **BRADEN** models
*for your truck winch needs*



**MS3 SERIES** Particularly well adapted for use on all light duty jobs handling loads up to 8,000 pounds. For behind cab mounting.

**MS6 SERIES** Rugged models rated at 15,000 pounds capacity. Equipped with Braden's special Oil Cooled, Fully Adjustable Automatic Safety Brake.

**MS9 SERIES** These models, rated at 20,000 pounds, are among the most popular winches in America. They are designed for low speeds, so are ideal for heavy handling jobs that require perfect load control.

**MS12 SERIES** The smallest of the Braden heavy duty models with a 30,000 pound capacity. They are especially adaptable for commercial elevator hoists and heavy duty trucking.

**MS10 SERIES** Very similar to the MS12 models except capacity is 45,000 pounds. The Braden Oil Cooled, Fully Adjustable Automatic Safety Brake is standard equipment on this series.

**MS30 -20B SERIES** A big baby designed for use on 2½ to 5 ton trucks. It has a rated capacity of 60,000 pounds, and has smooth, steady pulling power with stamina to spare.

**MS50 -20B SERIES** Here is the greatest capacity truck winch ever built on a production line. It has been tested to handle loads up to 100,000 pounds, and is designed to work perfectly on trucks of 5 tons or more.

Above are a few of the many BRADEN Truck Winches available from stock. In addition you may select underslung front end models, friction clutch winches, extended double drum units, as well as many varieties of custom designed models for special handling jobs. Write for complete information.

**BRADEN WINCH** DIVISION OF MOTOR PRODUCTS CORPORATION
P. O. BOX 547 • BROKEN ARROW, OKLAHOMA

*"In Service Around the World"*

For more facts, use Request Card at page 18 and circle No. 308



DITCH WITCH TRENCHER

**The measure of Success**

CALL COLLECT

SCALE

COMPARE

SIZE: DIGS FROM 4" TO 16" WIDE AND UP TO 6' DEEP

COSTS: AS LITTLE AS 2¢ PER FOOT!

ABILITY: JOB PROVEN!

LIFE: AS HIGH AS ½ MILLION FEET!

EASE OF OPERATION:
See a demonstration!
CALL COLLECT!

**CHARLES MACHINE WORKS, INC.**

636 B STREET • CALL COLLECT, FE 6-4404 • PERRY, OKLA.

For more facts, use Request Card at page 18 and circle No. 309

**Designed** for mounting on utility tractors, the Henry Model TL-4321 fork-lift features a maximum lifting height of 21 feet. Lifting capacity to full height is 2,500 pounds at 24-inch load centers. Standard equipment includes side shifter, overhead safety guard, load-limiter control to prevent overloading, and an automatic control valve to prevent free fall of the load in case of a hydraulic failure. For further information write to the **Henry Mfg. Co., Inc.**, Dept. C&E, P. O. Box 521, Topeka, Kans., or use the Request Card at page 18. Circle No. 9.

## New dc welder plant doubles as ac power unit

The new Hobart GW-2235-S combination dc welder and ac power plant provides 200 amp dc, at 25 volts, on 100 per cent duty cycle for straight or reverse polarity welding. It has a welding range of 30 to 325 amp suitable for intermittent use.

Power output is 2 kw at 110-volt ac of auxiliary power when welding or a full 5 kw of 110/220-volt ac current when the unit works as a generating plant.

Welding controls, welding terminals, four 110-volt ac power receptacles, and two 220-volt 3-wire twist-lock outlets are located on a panel at the generator end of the unit.

A Wisconsin 14.2-hp, 2-cylinder, air-cooled gasoline engine powers the generator. A trailer is optional equipment.

For further information write to the Hobart Bros. Co., Dept. C&E, Hobart Square, Box 8129, Troy, Ohio, or use the Request Card at page 18. Circle No. 82.

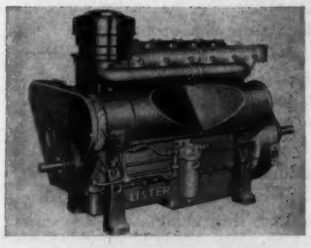
## Air-cooled diesel engine develops 72 horsepower

Lister-Blackstone, Inc., announces a new Lister air-cooled diesel engine.

This new model, designated HAB6, develops a continuous 72 horsepower at a maximum 2,000 rpm. Cooling is effected by two single-stage axial flow blowers coupled in tandem and belt-driven from the engine.

The fuel system comprises a lift pump delivering through a filter and a multi-element fuel pump to the injectors. Close governing is effected by a centrifugal governor driven through speed-increasing gears from the fuel-pump drive shaft. Provision for clutch power takeoff, or close coupling, is available with the SAE No. 2 flywheel housing.

For further information write to Lister-Blackstone, Inc., Dept. C&E, 42–32 21st St., Long Island City 1, N. Y., or use the Request Card that is bound in at page 18 of this issue. Circle No. 75.



*Winterize Your Safety Hats and Caps with these New* **JACKSON Quality Winter Liners!**

Men work better—and more safely—when they are comfortable. Your safety hat wearers will keep warm and dry this winter with Jackson quality winter liners. They're built to fit all hats, all workers, and all budgets. All are water washable. None have metal in them; electrical workers may choose freely.

**UTILITY** MODEL **FC-3** — Chrome yellow cotton twill. Medium and large sizes.

**STANDARD** MODEL **FC-1** — Grey cotton twill, flannel lined. Medium & large sizes.

**PREMIUM** MODEL **FC-2** — Grey with ¾" deep orlon pile lining. Med. & lg. sizes.

**CONVERTIBLE** MODEL **FC-4** — Detachable earflap uses plastic zipper. Med. & lg. sizes.

MODEL **KC-1** — Knitted navy blue 100% wool.

MODEL **CC-1** — Grey cotton twill flannel lined.

*Sold Everywhere by Better Distributors*

**Jackson Products**

31739 Mound Road, Warren, Michigan

For more facts, use Request Card at page 18 and circle No. 310



# MARVEL
## SYNCLINAL FILTERS

**FOR DEPENDABLE PROTECTION on all Hydraulic and other low pressure circulating systems**

Designed to give more ACTIVE filtering area—MORE dependable protection—MORE productive operation before cleaning is necessary. *Meet J.I.C. Standards.*

**Synclinal SUMP TYPE**

**CAPACITIES:** 5—8—10—20—30—50—75 and 100 G.P.M.
**PIPE SIZES:** ¾"—1"—1¼"—1½"—2"—2½" and 3".
**CONNECTIONS:** Coupling—Male Nipple.
**BY-PASS VALVE:** Not Available.

**Synclinal LINE TYPE**

**CAPACITIES:** 5—8—10—20—30—50—75 and 100 G.P.M.
**PIPE SIZES:** ¾"—1"—1¼"—1½"—2"—2½" and 3".
**BY-PASS VALVE:** Not available.
**OPERATING PRESSURES:** Up to 80 p.s.i.

**Bonded SUMP TYPE**

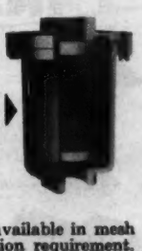
**CAPACITIES:** 10—20—30—50 and 75 G.P.M.
**PIPE SIZES:** 1"—1½"—1½"—2"—and 2½".
**CONNECTIONS:** Coupling—"O" Ring—Male Nipple.
**BY-PASS VALVE:** Available with or without

**Bonded LINE TYPE**

**CAPACITIES:** 10—20—30—50 and 75 G.P.M.
**PIPE SIZES:** 1"—1½"—1½"—2" and 2½".
**BY-PASS VALVE:** Available with or without.
**OPERATING PRESSURE:** Up to 250 p.s.i.
**OPERATING TEMPERATURES** up to 300° F.

**Tandem SUMP TYPE**

**CAPACITIES:** 10—16—20—40—80—100—150 and 200 G.P.M.
**PIPE SIZES:** ¾"—1"—1½"—1½"—2"—2½" and 3".
**CONNECTIONS:** Coupling—Male Nipple.
**BY-PASS VALVE:** Not available.



**IN-LINE FILTER**

**CAPACITIES:** Up to 60 G.P.M.
**PIPE SIZES:** ¾"—1"—1¼" and 1½" (at both inlet and outlet).
**BY-PASS VALVE:** Available with or without

**FILTERING MEDIA** in all Marvel Filters is Monel wire cloth available in mesh sizes of 30-40-50-60-80-100-150 and 200 to meet your filtration requirement.
**EASY TO CLEAN**—All Marvel Filters are easy to clean. Line type units operate in any position and may be serviced without disturbing pipe connections.
**OVER 900** O. E. M's. install Marvel Filters as Standard Equipment.

**IMMEDIATE DELIVERY**

***For further information on a specific type filter—Write—wire or phone***

**MARVEL ENGINEERING COMPANY**
**7227 N. Hamlin Ave., Chicago 45, Ill.**
**Phone: JUniper 8-6023**

Please send me information on Marvel Filters as indicated: **CE-12**

☐ Hydraulic Oils ☐ Coolants ☐ Lubricants ☐ Fire Resistant Fluids
☐ Water ☐ Sump Type ☐ Line Type ☐ In-Line

Name_____
Company_____
Address_____
City_____ State_____

For more facts, use coupon.

## Hardsurfacing rods made to specification

Cast and centerless ground hardsurfacing rods made to exact customer specifications are available from the WaiMet Alloys Co., a division of Howe Sound Co.

These rods can be applied by oxyacetylene flame or electrode coated, for application by either ac or dc electric arc deposit methods.

The close tolerance and uniform diameter achieved by centerless grinding permits close-tolerance extrusion of the electrode coating. Therefore, according to the manufacturer, an even amount of coating can be applied to the full length of the rod, thus eliminating thin spots in the coating and possible wavering of the arc.

The bare hardsurfacing rods are available in 1/16, ⅛, 5/32 3/16, ¼, 5/16, and ⅜-inch diameters. Rods from ⅛ to ⅜ inch are furnished in controlled lengths of 14 inches. Rods of these diameters can also be butt-welded to provide extendible lengths up to 8 feet. The 1/16-inch-diameter rods are available in random lengths from 6 inches.

For further information write to WaiMet Alloys Co., a division of Howe Sound Co., Dept. C&E, 5320 Oakman Blvd., Dearborn 2, Mich., or use the card at page 18. Circle No. 46.

**A tripod-mounted transmitting-receiving unit is set in place, while miles away another crew member is setting up an identical unit to begin distance measuring operations. Called Electrotape, the unit is said to measure quickly distances up to 100 miles with an accuracy of 1 inch. The unit is being used here in the second stage of a surveying and aerial mapping project to chart the more than 4,000 square miles of San Diego County, Calif. For further information write to the Cubic Corp., Dept. C&E, 5575 Kearny Villa Road, San Diego, Calif., or use the Request Card at page 18. Circle No. 67.**

**WISCONSIN TILT TRAILERS**

**Model 1020 for safe, fast, economical, one-man loading, unloading of equipment up to 12 tons. Automatic hydraulic EASY UP . . . EASY DOWN deck, and low load angle saves time every haul. Doubler plates at all critical welds . . . exclusive rear channel mounting assures permanent strength . . . won't tear out EVER!**

**Model 1020 only $1525 w/tires & deck, plus freight and tax**

**CHECK THESE ADVANTAGES**

- rugged 2" oak deck 76" wide
- straight through axle
- extra deep tapered box channels for double strength
- tandem wheel design, ends spring road restriction worries
- walking beam oscillates on Timken bearings, no dismantling to lubricate

**WISCONSIN TRAILER COMPANY, INC.**

Richfield, Wisconsin Phone HUBERTUS 108

For more facts, circle No. 311


## Electric wheel drive for 29 to 33-inch rims

Repowering off-highway vehicles with electric drive is now possible with the newly announced small version of General Electric's motorized wheel.

This development makes an electric drive system available to owners of vehicles with rims in the 29 to 33-inch range.

According to the manufacturer, it is relatively simple to replace existing mechanical equipment with electric drive. In addition, multiple-engine arrangements are not necessary, since motorized wheels can provide all-wheel drive from a single engine supplying electric power through a dc generator.

The new development can be applied on equipment such as self-loading scrapers; king-pin-steering top-loading vehicles; tractors; and shovels.

For further information write to the General Electric Co., Dept. C&E, 1 River Road, Schenectady 5, N. Y., or use the Request Card at page 18. Circle No. 84.

## Three new models in chain-saw line

A completely redesigned line of chain saws has been announced by The Eska Co., Inc.

The three new models include a 3½-hp saw with 16-inch bar; a 5½-hp saw with 20-inch bar; and a 7½-hp saw with 24-inch bar. These saws are all direct-drive with centrifugal drum-type clutch.

Each engine carries heavy-duty needle-type bearings and a fiber-type air filter.

For further information write to The Eska Co., Inc., Dept. C&E, Dubuque, Iowa, or use the Request Card at page 18. Circle No. 115.

**MOBILE OFFICE Units are low in cost . . . Built to your specifications . . . There's a unit to fill your every need.**

**Because MOBILE OFFICE Units are easy to move from job to job, they enable you to have office, engineering, paymaster and other facilities at every point of your operation.**

**These units are economical, time saving, rugged and durable. They are self-containing, and are available with air-conditioning, and can be fitted to your specifications.**

**MOBILE OFFICES are being used by major contractors and other major businesses throughout the United States. In every case they have proven their worth.**

**Remember, whatever your needs may be, a MOBILE OFFICE Unit can be built to fill your requirements.**

***If It's Mobile . . . We Build It!***

**MOBILE OFFICE, INC.**
Phones: DOrchester 3-1048-9

**7314 Stony Island Avenue, Chicago 49, Illinois**

For more facts, circle No. 313

**FOR TEMPORARY HEAT ON ALL WINTER WORK . . . INSIDE-OUTSIDE . . . USE**

**INSTO-HOT**

**SALAMANDERS** LP GAS 4 MODELS

*FEATURES*

- PORTABLE
- CLEAN
- ECONOMICAL
- NO FUMES
- NO SMOKE
- NO SOOT

**BLOWER HEATERS** LP GAS 2 MODELS

*TYPICAL USES:* DRYING PAINT AND PLASTER . . . CURING CONCRETE . . . WORKER'S COMFORT . . . HEATING WAREHOUSES, SHANTIES, SHEDS AND MATERIALS.

**INFRA-RED HEATERS** LP GAS 3 MODELS

THE MOST COMPLETE LINE OF PORTABLE HEATERS WITH CAPACITIES UP TO 150,000 BTU PER HOUR, BOTH MANUAL AND AUTOMATIC OPERATION. PRICES $19.50 AND UP

• WRITE OR WIRE FOR COMPLETE INFORMATION •

**INSTO-GAS CORPORATION**
996 E. WOODBRIDGE • DETROIT 7, MICHIGAN

For more facts, circle No. 312

**SEE Sasgen FOR CONTRACTORS' DERRICKS • HOISTS • WINCHES**

- Easily rigged on the job
- Conservatively rated for safety
- Simple in design, easily maintained.

**ROOFERS' CIRCLE SWING DERRICKS**
360° operation. 500 to 2500 lb. capacities. Optional type of power. Champion electric shown.

**CONTRACTORS' HOISTS**
Single or double drum types with capacities from 500 to 5500 lb. single line pull. Optional type of power.

**Hand-Powered WINCHES**
Safe worm or spur gear design. Sizes for 400 to 40,000 lb. load. No. 110 shown.

*Write for latest catalog.*

**Sasgen DERRICK COMPANY**
3127 GRAND AVENUE CHICAGO 22, ILLINOIS

For more facts, circle No. 314

Drawing power from the truck battery, the Porta-Power digger, with auger extensions, can dig holes to a depth of 48 inches.

## Portable power digger for one-man operation

A portable power digger designed to dig from 3 to 7-inch holes to 32-inch depths or more in all types of soils is offered by the Speed King Mfg. Co.

Designed for one-man operation, the Porta-Power digger is powered through 20-foot flexible cables quick-clamped to the 12-volt electrical system of a car, truck, or tractor.

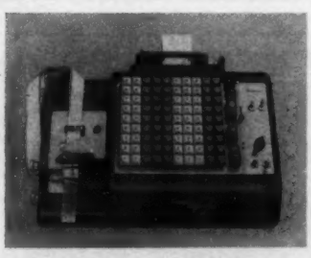
Extensions for the auger provide up to 48-inch hole depth.

For further information write to the Speed King Mfg. Co., Dept. C&E, Ensign, Kans., or use the Request Card at page 18. Circle No. 116.

## Data-processing machine for use in accountancy

A portable source data originator designed exclusively for data processing in accountancy has been announced by the Monroe Calculating Machine Co., Inc. Available in both single-register and duplex models, the unit is called the Synchro-Monroe Model P-03 Accountaints' Program punch-tape adding machine.

Compatible with data processors of



all service bureaus, the machine universalizes source data origination in processing for accountants. It features automatic repetition of all code information, eliminating the need of re-indexing repetitive reference numbers.

Another new feature is Accountants' Program keyboard symbols, providing clear-cut identification of operating controls. Five excess codes for the future give new versatility in systems improvement and eliminate the chance of machine obsolescence.

For further information write to the Monroe Calculating Machine Co., Inc., a division of Litton Industries, Dept. C&E, 555 Mitchell St., Orange, N. J., or use the Request Card that is bound in at page 18 of this issue. Circle No. 117.

## New 12-inch photocopier is completely portable

A new 12-inch diffusion transfer photocopier is announced by Ampto, Inc.

Called the Ampto 12, the machine will make copies measuring up to 12 inches wide by any length.

Mechanical and automatic control features include built-in dispenser for negative paper; light weight and complete portability; and fully automated solution control.

For further information write to Ampto, Inc., a subsidiary of the Anken

Chemical & Film Corp., Dept. C&E, Newton, N. J., or use the Request Card at page 18. Circle No. 45.


BUILD HIGHWAYS THE ROME WAY

CLEARING RIGHT-OF-WAY. Rome K/G Clearing Blade shears off trees and brush, cuts stumps out below ground, then piles cut trees and stumps for clean burning.

AERATING. Rome Model TRH 20-30 Hinge Type Offset weighs over 9,000 lbs.—heavy duty construction for less maintenance, longer life.

MIXING AND BLENDING. Rome Model TRCH 10-36 Hinge Type Offset Disk Plowing Harrow cuts up to 13" deep for low cost mixing, blending, bonding lifts.

TOUGH, VERSATILE AND MONEY SAVING. Rome Disk Plowing Harrows are available in many sizes and types. For aerating, mixing, scarifying, pulverizing—there's a ROME for your job, your equipment. See your Rome-Caterpillar dealer.

ROME

ROME PLOW COMPANY
Cedartown, Georgia

For more facts, use Request Card at page 18 and circle No. 315

DON'T THROW AWAY CRACKED DIESEL CYLINDER HEADS

You can save 50% of replacement cost with Factory Rebuilt Swick-Guth Heads. Swick-Guth restores cracked or worn heads, blocks, transmission cases to a Guaranteed good as new condition by the Controlled Heat Process . . . successfully used for more than a Quarter Century.

GUARANTEED TO YOUR SATISFACTION

Send today for price list and a free booklet on the famous Swick-Guth Process, and the name of the dealer nearest you.

SWICK-GUTH CO.
McPHERSON KANSAS • FORMERLY GUTH CO.
"SPECIALISTS IN WELDING DIESEL CASTINGS"

For more facts, circle No. 316

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100 ultra-modern, luxurious rooms in downtown. Beautiful Mayfair Dining Room, Jubilee Cocktail Lounge. TV and Telephones in all rooms. American Express and Carte Blanche Credit Cards honored.

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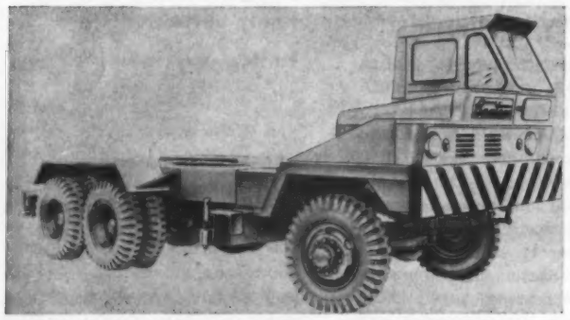
| Meadows Motel | North Plaza Motel | Terrace Motel | Executive Inn* |
| Executive Inn | Town Center Motel | | ALBUQUERQUE, N.M. |
| LOUISVILLE, KY. | CALUMET CITY, ILL. | NORFOLK, VA. | Executive Inn* |
| Standiford Motel | Town & Country Motel | Admiralty Motor Hotel | *(Opens Soon) |
| Towne Terrace | | | |

• For information — Write: Executive Inn, 401 E. Washington, Indianapolis, Indiana.

For more facts, circle No. 317



A 220-hp V-8 gasoline engine powers the Model 406 crane carrier. The frame is a 15 × 6-inch box section, for maximum strength.

## Add new 6 x 6 model to crane-carrier line

The Schield Bantam Co. announces a new crane-carrier unit, the Model 406.

The 6 × 6 carrier is designed for mounting the Bantam Model T-350 upper unit of 11-ton capacity.

Standard features of the Model 406 carrier include a 220-hp V-8 gasoline engine; air brakes on all wheels; 9.00 × 20, 10-ply tires; and power steering. Optional center and rear outriggers are of the 6 × 11-inch double-box by-passing type.

For further information write to the Schield Bantam Co., Dept. C&E, 219 Park St., Waverly, Iowa, or use the Request Card at page 18. Circle No. 72.

## Offer shoring system for beams and slabs

A substantial saving in lumber, labor, and equipment is said to be possible with the new Adjustomatic scaffold-truss available from Automatic Devices, Inc.

Used for shoring interior and spandrel beams and open slabs, this system incorporates a weight-bearing truss that permits the use of fewer frames because of better distribution of shoring weight, according to the company.

Truss design allows for precise placement of standard jack screws under ledgers to substantially reduce cutting, wedging, and fitting of stub lumber, spandrel-beam tee-heads, and short soffit headers.

Jack screws, which take seconds to adjust, are used to directly support open slab areas and ledgers at the side of the beam box. The jack screw can be used from job to job.

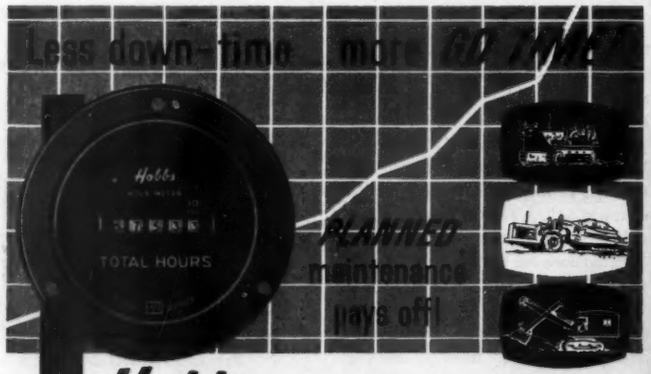
For further information write to Automatic Devices, Inc., Dept. C&E, 2400 Adie Road, Maryland Heights, Mo., or use the Request Card at page 18. Circle No. 3.

The Stanley Model 404 cuts holes up to 4 inches in diameter in concrete, brick, and granite.

## Electric impact drill is heavy-duty tool

A new electric impact drill with high-frequency rotating action has been announced by Stanley Electric Tools, division of The Stanley Works.

Called Model 404, the unit is said to combine all the major advantages of a heavy-duty electric drill and power hammer in one compact unit. It cuts openings from 3/16 inch to 4 inches in diameter in concrete, brick, and rock granite. According to the manu-


**Hobbs HOUR METERS**

For better performance and longer service from your equipment, plan maintenance on operating TIME . . . you'll also set up a realistic basis for renting and leasing, service contracts, buying and selling. Be sure with Hobbs electric timing instruments — revolution counters can't do the job! Available for ALL your equipment: d-c meter for engine or battery-powered units . . . a-c meter for line-powered equipment.

● *Manufacturers also of pressure switches . . . shock-mounted head, tail and dash lights . . . indicator, instrument and warning lights. Distributors in principal cities . . . WRITE FOR CATALOG 600.*

Symbol of SW Excellence

*John W. Hobbs Corporation*
A DIVISION OF STEWART-WARNER CORPORATION

For more facts, use Request Card at page 18 and circle No. 318

# CONTRACTORS LOVE IT...

**A WILLIAMS DIGGER IS AS VITAL TO A CAISSON PROJECT AS A GIANT TURBINE IS TO HOOVER DAM.**

**IMPRESSIVE:** Speed and versatility make the Williams digger the most impressive show on a building site.

**POWERFUL:** From the moment the auger touches the ground Williams power performs the task of a thousand hands.

**DEPENDABLE:** From the Equator to the Arctic, in fair weather and foul, you can depend on a Williams digger to do the job most economically.

**ESSENTIAL:** From the Stone Age 'til Modern Times the need was never known, but now — the Williams digger is as essential as the turbine to Hoover Dam. Why wouldn't — Contractors Love it?

HUGH WILLIAMS

Manufactured by
**HUGH B. WILLIAMS MFG. CO.**
8330 Lovett Ave.
P. O. Box 7815 • Dallas, Texas

Write Exclusive Distributor
**JOSLYN MFG. & SUPPLY CO.**
2101 Corinth St. • Dallas, Texas
for DESCRIPTIVE LITERATURE

For more facts, use Request Card at page 18 and circle No. 319

*NO TIME OF YEAR FOR TB. Is there ever a right time? Of course not. But Christmas, more than any other season, should be a time of glowing good spirits, health and happiness. In the fight against TB, it can at least be a time of hope—when millions of Americans help by using Christmas Seals. Answer your Christmas Seal letter today.*

facturer, it also cuts through steel reinforcing rods embedded in concrete without deflection.

The drill action is said to provide clean, precise cuts without chipping, cracking, or breaking out when close to an edge, with little or no spalling at the end of a cut.

With proper extension couplings, this impact drill is capable of boring holes from 10 to 30 feet deep, depending on the type of material being drilled.

The No. 404 is small, easy to transport, and designed for one-man operation.

For further information write to Stanley Electric Tools, division of The Stanley Works, Dept. C&E, 195 Lake St., New Britain, Conn., or use the Request Card at page 18. Circle No. 79.

## Blade on new tractor hydraulically operated

The LeTourneau-Westinghouse Co. announces a new Model C Tournatractor with hydraulically operated attachments as a companion unit to the current C Tournatractor with electrical controls.

The machine utilizes a high-pressure hydraulic system of 5,000 psi. In addition, this unit uses a direct-drive, Dynex piston pump, instead of the usual vane or gear type.

Powered by a GM 218-hp engine, the new Model C Tournatractor has a top speed of 18.5 mph.

The new C tractor is powered by a GM 6V-71 engine, producing 218 horsepower. The transmission is the LeTourneau-Westinghouse power-shift type, air-actuated with torque converter, 4 speeds forward, and a top speed of 18.5 mph.

Another new feature is the integral, 1,400-rpm, power takeoff, for use with the double-drum power-control unit in operation of towed equipment.

Over-all length of the tractor is 13 feet 6 inches, without the blade. Over-all width is 10 feet 6 inches.

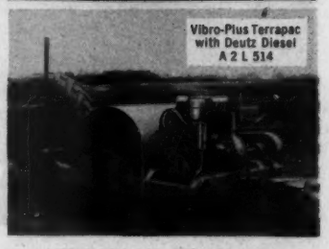
A new dirt-handling blade is also offered for use with both Model C Tournatractors. This blade is 13 feet long, 3 feet 9 inches high, and has a maximum pitch adjustment of 12 degrees. The blade weighs approximately 5,000 pounds.

For further information write to the LeTourneau-Westinghouse Co., Dept. C&E, 2301 N. E. Adams St., Peoria, Ill., or use the Request Card at page 18. Circle No. 60.

*For further information on any product described in this section circle the indicated number on the Request Card at page 18.*

For more facts, use Request Card at page 18 and circle No. 320

DEUTZ AIR-COOLED DIESELS GIVE YOU MORE COMPACTION —LESS DOWNTIME




**Fewer passes**—You can level a site (any soil) to 100% density faster, at less cost with a DEUTZ-powered vibratory roller. 8 million yards of sand were compacted at Griffiss Air Force base with DEUTZ-powered Vibro-Plus rollers... at great savings.

**Less downtime**—Deutz Air-cooled Diesels because of their rugged construction aircooling and compact design, eliminate the problems usually associated with water-cooling systems.

**You can get these benefits**—if you don't have a DEUTZ equipped roller, a DEUTZ power-pack is available.

**DEUTZ Diesels do other tough jobs**—on graders, earthmovers, shovels, concrete mixers, compressors and generator sets. Air-cooled DEUTZ diesels stand up under heat up to 140° Fahrenheit, arctic cold, tropical humidity. AIR-COOLED DEUTZ DIESELS range from 5 to 250 HP in 1, 2, 3, 4, 6, 8, and 12 cylinder models.

DEUTZ Diesel Energy Corporation
82 Beaver St.,
New York 5, N. Y.

Please send facts on further advantages of Air-cooled DEUTZ Diesels for:

☐ Industrial uses ☐ Construction
I am ☐ Operator ☐ Dealer C&E 1

Name .....
Address .....
City .....Zone .....State .....

For more facts, use coupon or circle No. 322

LOW COST...EASY OPERATION

Rivinius
LIVE POWER STEERING
for CAT D8 Tractors
*(prior to 14A models)*

**SAVES MAN-POWER:** Operator fatigue goes down... performance goes up! Finger tip control Live Power Steering provides closer, faster control of D8 power and maneuverability.

**SAVES CLUTCHES:** No wasteful slippage and clutch wear...on each turn the clutches are engaged smoothly into complete seizure.

**SAVES TIME:** Levers move only 1½" and return automatically when released. Operators report they can operate a D8 one, sometimes two speeds faster with Rivinius Live Power Steering.

**SAVES DOLLARS:** This new Rivinius system is compact, easy to install on D8's in the field...consists of hydraulic cylinder, valve, pump, reservoir, brackets and hardware.

*See your Caterpillar dealer now...or write:*
**Rivinius, inc.**
EUREKA, ILLINOIS
For Caterpillar Motor Graders: Torque Steering Booster ...Hydraulic Moldboard Shift...Snow Blower...Snow Loader
For Caterpillar D8 Tractors: Live Power Steering

For more facts, use Request Card at page 18 and circle No. 321

## Transmission handler has half-ton capacity

A hydraulically powered transmission handler is offered by the Auto Specialties Mfg. Co.

Known as Ausco Model A10-9, the unit is designed to speed up and simplify one-man removal and replacement of any type of light truck transmission. Lightweight and portable, it has a capacity of 1,000 pounds.

Controls are conveniently located for fast work from a creeper. A hydraulic pump handle swings to either side for right or left-handed operation. Four large full-swiveling casters permit easy placement and moving of transmission to work bench or fixture.

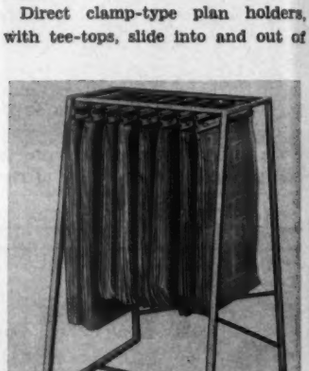
For further information write to the Auto Specialties Mfg. Co., Dept. C&E, St. Joseph, Mich., or use the card at page 18. Circle No. 29.

## Vertical blueprint file holds 1,200 prints

Now available to users of blueprints is Momar Industries' all-steel Glider 1200 vertical blueprint file.

Designed for filing larger prints in smaller areas, the unit is 32 inches long, 36 inches deep, and 60 inches high.

Direct clamp-type plan holders, with tee-tops, slide into and out of



rigid channel tracks. In filing position, plan holders are fully enclosed.

Three spaced thumbscrews on plan holders are loosened for insertions or withdrawals. Remaining plans are not disturbed.

This model is designed to hold up to 1,200 individual sheets.

For further information write to Momar Industries, Dept. C&E, 4176 W. Montrose Ave., Chicago 31, Ill., or use the Request Card at page 18. Circle No. 24.

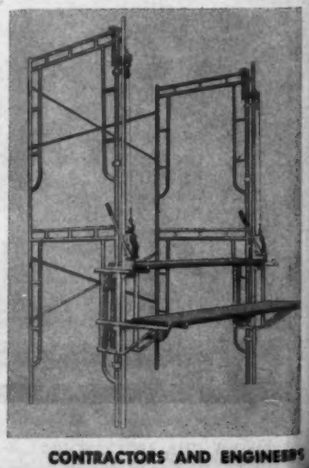
## Traveling side bracket for steel scaffolding

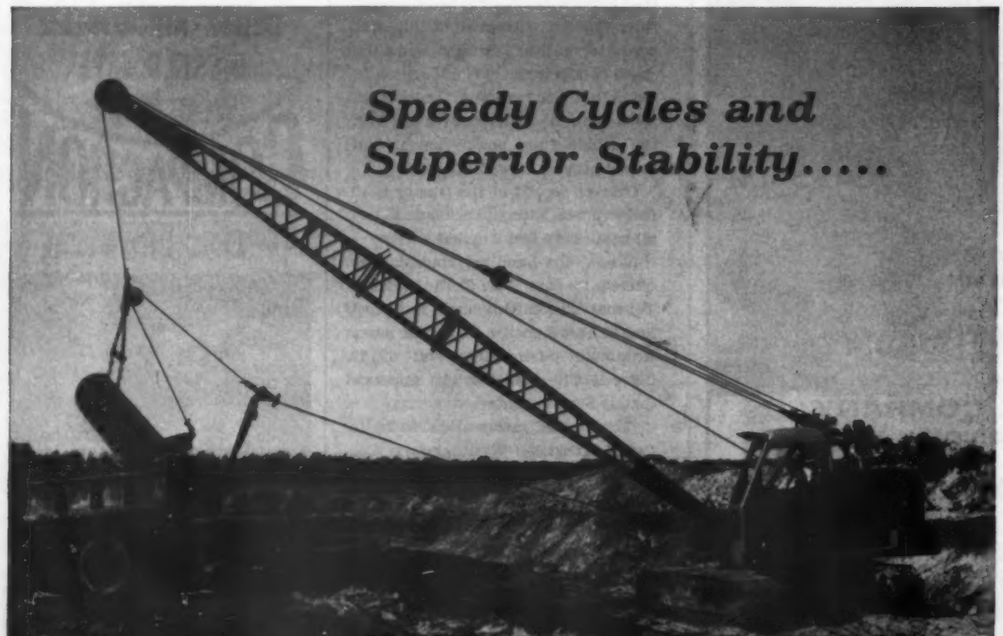
A traveling side bracket, for use in connection with the firm's line of tubular steel scaffolding, is offered by Bil-Jax, Inc.

The manually operated units, used in a series of two or more, enable workers and materials to go up as the work progresses. No additional hoisting equipment is needed.

The bracket, constructed of tubular steel, employs an aluminum winch, featuring a double ratchet for safety.

For further information write to Bil-Jax, Inc., Dept. C&E, P. O. Box 38, Archbold, Ohio, or use the Request Card at page 18. Circle No. 94.




**UNIT gives you more Earning Power on dragline jobs**

You'll find two essentials of profitable dragline service combined in a UNIT — speedy operating cycles, through full use of power, and outstanding stability. You save power and gain speed with UNIT direct-in-line drive from engine to main machinery. Power is transmitted through a worm drive with minimum loss due to friction. This is one of many UNIT built-in values that pay off in greater job output.

UNIT extra long crawlers and wider axles and shoes provide perfect balance, too. Stability is superior . . . you can work faster without continuous tipping on long or low boom work.

A UNIT DRAGLINE gives you these two important advantages . . . and many more. You get a one-piece cast main machinery gear case with all gears, shafts, and bearings operating in an oil bath; automatic traction brakes; twin hook rollers; and all disc-type operating clutches.

Your UNIT dealer has full information on ½ to ¾-yd. draglines, fully convertible to other front ends. See him soon for the full UNIT story.

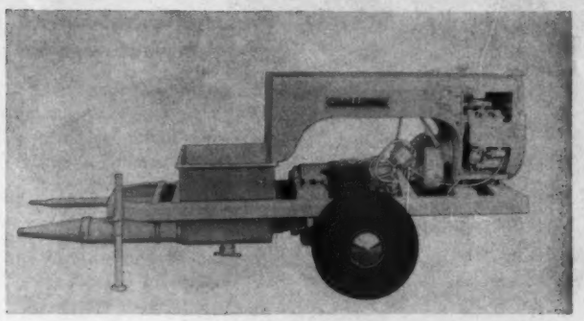
UNIT

UNIT CRANE & SHOVEL CORP.
6309 W. Burnham Street
Milwaukee 19, Wisconsin

SHOVELS: ½ to ¾ YDS. • HOES: ½ to ¾ YDS. • CRANES: 5½ to 40 TONS • DRAGLINES: ½ to ¾ YDS.

For more facts, use Request Card at page 18 and circle No. 323

## Grout pump, hoister rig is trailer-mounted unit



Challenge-Cook Bros., Inc., announces a new grout pump and hoisting machine known as the Grout King.

This heavy-duty machine reportedly will pump up to 20 cubic yards of material per hour, hoist material more than 10 stories high, and pump material more than 300 feet horizontally.

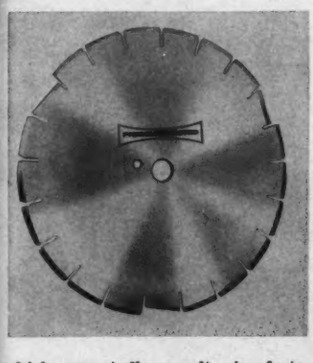
The Grout King is powered with a 30-hp air-cooled engine equipped with an electric self-starter as standard equipment. It has a 3-speed transmission with one reverse gear to assist in clean-out work, and is trailer-mounted for easy towing from job to job.

For further information write to Challenge-Cook Bros., Inc., Dept. C&E, 3334 San Fernando Road, Los Angeles 65, Calif., or use the Request Card at page 18. Circle No. 39.

## Diamond saw blades have "raker" design

The Diamond Tool Research Co. has introduced a new series of diamond masonry and concrete saw blades. The blades feature both pressure-tested diamond grits and a tungsten-carbide bond.

The new blade embodies a special "raker" design built into the rim,



which reportedly results in faster cutting and eliminates undercuttings by removing or "raking" out the chips of concrete.

These blades are available in all standard diameters and thicknesses.

For further information write to the Diamond Tool Research Co., Inc., Dept. C&E, 380 Second Ave., New York 10, N. Y., or use the Request Card at page 18. Circle No. 25.

## Pocket-size, 2-way radio for construction jobs

A portable 2-way radio designed to permit constant communication on construction projects is announced by the Osborne Electronic Sales Corp.

A simple communication network can easily be established by equipping operation headquarters as a base station and vehicles and key personnel with transceivers—a communications system that can be disassembled in minutes for the next job.

Called the Duo-Com 100, this pocket-size radio weighs only 20 ounces. It is powered by eight miniature penlight cells, affording 40 hours of continuous use.

Since it operates in the 27-megacycle range, no license or permit is required by the FCC, the company points out.

For further information write to the Osborne Electronic Sales Corp., Dept. C&E, 13105 S. Crenshaw Blvd., Hawthorne, Calif., or use the Request Card at page 18. Circle No. 119.

*By assisting in "good-neighbor" shot planning!*

Cyanamid's explosives representative assists you in shot planning that assures both maximum blasting effectiveness and minimum neighborhood inconvenience.

In his planning he considers such factors as job location, rock formation and drillability, vibration effects, concussion or flyrock and presence of damageable property. From his study he prepares a drilling and blasting pattern that includes spacing on boreholes, loading ratio, method of detonation, type and grade of explosives and other details that determine economical and successful blasting operations.

If you wish, he will help you work out a plan for acquainting the public with all details of blasting and safety precautions taken. This eases many of the problems associated with blasting . . . helps your job progress on time and within estimate.

***Don't forget Cyanamid's job-winning Pre-Bid Service!***

By conducting a careful pre-bid investigation, Cyanamid's explosives representative offers contractors valuable assistance in estimating hard-rock blasting costs. Next time you bid on a hard-rock job, let an experienced Cyanamid explosives representative help you *get* and *do* the job!

**AMERICAN CYANAMID COMPANY**
EXPLOSIVES AND MINING CHEMICALS DEPARTMENT
30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

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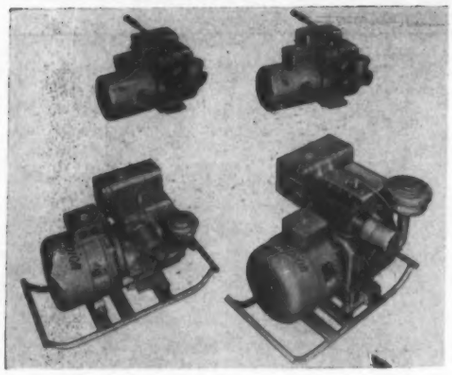
SALES OFFICES: Denver, Colorado • Maynard, Massachusetts • Kansas City, Missouri • St. Louis, Missouri • Albuquerque, New Mexico New York, N.Y. • Tulsa, Oklahoma • Latrobe, Pennsylvania • Pottsville, Pennsylvania • Dallas, Texas • Salt Lake City, Utah • Bluefield, West Virginia
PLANTS: Latrobe, Pennsylvania • New Castle, Pennsylvania • Springville, Utah
PRODUCTS: High Explosives • Permissibles • Seismograph Explosives • Blasting Agents • Blasting Caps • Electric Blasting Caps • Blasting Accessories

For more facts, use Request Card at page 18 and circle No. 324



## New additive offered for winter bricklaying

Winter Gard, an antifreeze for cement and concrete, said to allow the laying of brick safely at temperatures reaching 15 degrees F is available from the Federal Chemical Products Co.

Less gaging water is needed with Winter Gard, so that shrinkage caused by water evaporation is reduced. Normal 7-day strength is reached in 3½ days, states the manufacturer. Winter Gard is also said to improve workability, increase watertightness, and not cause efflorescence in the spring.

For further information write to the Federal Chemical Products Co., Dept. C&E, Box 1794, Cleveland 5, Ohio, or use the Request Card at page 18. Circle No. 6.

## Portable generator line has 60, 180-cycle units

The Champion Mfg. Co. announces a new line of 60 and 180-cycle portable electric generators.

The 60-cycle generators range in watt rating from 1,000 to 3,500. They are single-phase 115-volt ac generators with two outlets. A pilot-light socket can be used as an additional outlet.

Champion's 2,500-watt 180-cycle generator has two 230-volt 3-phase outlets and two 115-volt dc outlets. It features an automatic gas saver that idles the engine when tools are not in use.

For further information write to the Champion Mfg. Co., Dept. C&E, 3700 Forest Park Ave., St. Louis 8, Mo., or use the Request Card at page 18. Circle No. 58.

## Portable gantry handles loads up to 30 tons

A portable, self-raising gantry for loads up to 30 tons is offered by Ontario Equipment, Inc.

Called the Colossus, the gantry is made up of two A-frame legs, a crossbeam, fixed wheels or casters, and the hoisting mechanism. With clear spans ranging from 9 to 16 feet and headroom from 10 to 20 feet, the Colossus is suitable for hand block and tackle or electric hoisting gear.

The A-frame legs are adjustable to give the gantry greater height flexibility. The wheels are grooved for use on rails. Caster wheels are optional.

For further information write to Ontario Equipment, Inc., Dept. C&E, Route 66 and Grand, McCook, Ill., or use the Request Card at page 18. Circle No. 28.

## Announce new power saw for extra-heavy duty

The Foresters' Fury 683, an extra-heavy-duty power saw with a 2.7 : 1 gear ratio, is offered by the Lombard Governor Corp.

The unit's diaphragm-pump-type carburetor allows all-position cutting. Other features include a longer spike bumper for more gripping power; front handle bar set at right angles to cutter bar for use in sighting; and a flameproof muffler.

For further information write to the Lombard Governor Corp., Dept. C&E, 68 Main St., Ashland, Mass., or use the Request Card at page 18. Circle No. 56.

# ONLY LOADER WITH 5-WA HYD

**Allis-Chalmers tractor loaders offer extended service life, far less downtime by thoroughly cleaning all air and filtering all hydraulic oil.**

Unmatched filtering protection—that's what get in all Allis-Chalmers tractor loader models.

Air is double filtered by:
1. air breather
2. air filter

Hydraulic oil is cleaned by:
3. full-flow micronic filter
4. conical screen
5. magnetic filter

This 5-way filtering protection brings peak hydr operating efficiency . . . extended service life.

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lis-Chalmers
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minate shifti
*ngle-lever cont*
*ated dump cy*
rt; *extra reach*
for moving
Your Allis-C
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**move ahead w**

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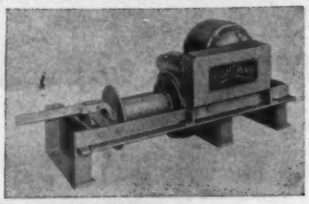
### Winches in capacities up to 30,000 pounds

The Stanspec Corp. announces its new line of Rightway winches available in capacities from 500 to 30,000 pounds, and in 24 standard models with electric, air, gasoline, or hydraulic power.

Standard and custom models are designed to customers' requirements from interchangeable standard components.



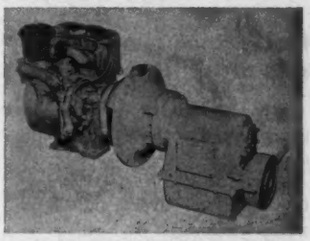
For further information write to the Stanspec Corp., Dept. C&E, 2138 Lee Road, Cleveland 18, Ohio, or use the card at page 18. Circle No. 99.

### Torque-converter drive for powered equipment

The Prime-Mover Co. announces an improved hydraulic 3-element, single-stage torque-converter drive for use in powered equipment.

It is designed to be direct-connected to liquid and air-cooled engines in the 18 to 35-hp range, and features a gear-type charging pump.

For further information write to The Prime-Mover Co., Dept. C&E, Highway 22 E, Muscatine, Iowa, or use the Request Card at page 18. Circle No. 121.



# HYDRAULIC PROTECTION

mplete filtering protection is just another way lis-Chalmers tractor loaders set the pace in the der field. They also feature: *pin-connected axles* that minate shifting and rolling under load; *exclusive gle-lever control* of all speed and direction; *safe, well-cated dump cylinders* that are up and away from rt; *extra reach* for easier dumping and *added stabil-* for moving big loads without tipping or spilling. Your Allis-Chalmers dealer can give you facts on 5 tractor loader models—ranging in capacity m 1 to 5 cu yd, in power from 76.5 to 130 horse-wer. Allis-Chalmers, Construction Machinery vision, Milwaukee 1, Wisconsin.

**ALLIS-CHALMERS**

**. . . power for a growing world**

For more facts, use Request Card at page 18 and circle No. 325

## Rotary compressor is skid or trailer-mounted

A new 600-cfm rotary compressor is announced by the Davey Compressor Co.

Known as Model 600-RP, the unit is available in both skid and 4-wheel-trailer mountings. The engine is a Cummins diesel.

The trailer is 141 inches long, 79 inches wide, and 92 inches high. Weight is 8,800 pounds.

For further information write to the Davey Compressor Co., Dept. C&E, Franklin Ave., Kent, Ohio, or use the Request Card at page 18. Circle No. 118.

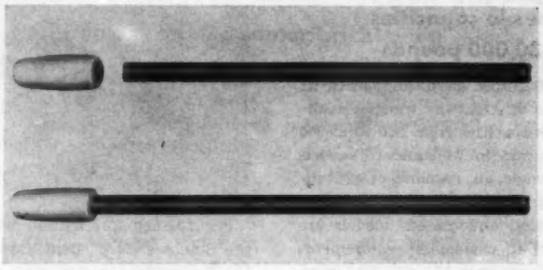
## Offer gold-plated shovel for ceremonial occasions

Gold-plated shovels for ground-breaking ceremonies are available from The Wood Shovel & Tool Co.

The blade, the D-handle, and the retainer band on the handle grip are all heavily gold-plated.

Each tool is suitable for engraving, and for framing or mounting for presentation after the ceremonial occasion.

For further information write to The Wood Shovel & Tool Co., Dept. C&E, Piqua, Ohio, or use the Request Card that is bound in at page 18. Circle No. 95.



## Protective enclosure for detonating fuse

A new protective enclosure for preserving the effectiveness of detonating fuse by preventing water absorption in wet blast holes is announced by the Austin Powder Co.

This plastic device is recommended for sealing all fuse ends in the bottom or top of wet holes. Its use is said to be particularly important in bottom charges where water problems may affect final results.

For further information write to the Austin Powder Co., Dept. C&E, 458 Rockefeller Bldg., Cleveland 13, Ohio, or use the Request Card at page 18. Circle No. 19.

## New 8 to 18-yard shovel for quarry excavation

A new addition to its line of quarry excavators—the Model 270-B electric shovel—has been announced by the Bucyrus-Erie Co. It is designed with unique front-end flexibility to accommodate booms up to 100 feet long and dipper capacities from 8 to 18 cubic yards.

Of particular note is a new variable-voltage static control system that employs magnetic amplifiers with no moving parts. Advantages claimed are: trouble-free, instant-response operation; unlimited no-load speed selection within speed range of system; constant load speed up to torque limit; control of drive speed; and high available stalled bail pull in all operating points.

For further information write to the Bucyrus-Erie Co., Dept. C&E, South Milwaukee, Wis., or use the card at page 18. Circle No. 41.

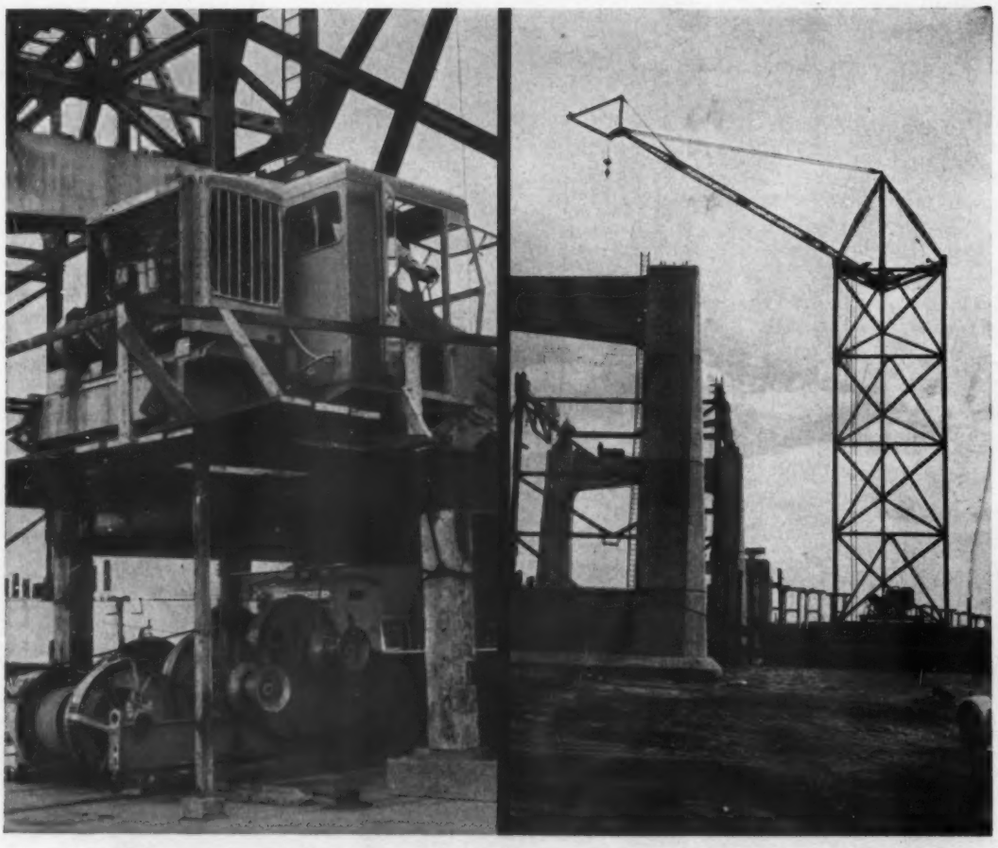
## Instrument measures hardness of mortar

A new laboratory instrument for measuring the rate of hardening of mortars sieved from concrete mixtures has been announced by Soiltest, Inc.

Called a mortar penetrometer, the instrument operates by means of penetration needles to determine the rate of hardening. Penetration resistance is measured by the force exerted to penetrate a mortar sample to a depth of 1 inch. The penetration force is measured by the compression of a calibrated spring inside the instrument. Graduations are to 1 pound.

The device may be used to determine the effects of variables such as temperature, cement, mix design, additions, and admixtures upon the hardening characteristics of concrete.

For further information write to Soiltest, Inc., Dept. C&E, 4711 W. North Ave., Chicago 39, Ill., or use the Request Card at page 18. Circle No. 55.

# AMERICAN BRIDGE DOUBLE DECKS CLYDE HOISTS ON BARGE MOUNTED TOWER DERRICK

The two Clyde Hoists used by American Bridge Division of U.S. Steel Corp. were years apart in manufacture. In age and appearance they were very different. But in the important measurements of hoist value they are identical twins.

Both Clyde Hoists were carefully engineered, trademarked by integrity of manufacture and performance that equaled or exceeded claim or promise. Both were carefully designed and ruggedly constructed to lower material handling costs with greatest possible safety; to require minimum maintenance and to offer maximum accessibility for servicing.

Clyde has been building good hoists . . . the best hoists . . . for more than seventy-five years.

*Write for Bulletin 34A for specifications on the complete line of Clyde Hoists*

American Bridge Division, United States Steel Corporation has a 165 foot, barge-mounted tower derrick to set steel on the center span of the new high bridge at Duluth-Superior, western terminal of the St. Lawrence Seaway. Two Clyde Hoists were used, one to operate the derrick and one to position the barge.

CLYDE IRON WORKS, Inc.

Established 1899
DULUTH 1, MINNESOTA

HOISTS : DERRICKS : WHIRLEYS : BUILDERS TOWERS
UNLOADERS : CAR PULLERS : ROLLERS

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For more facts, use Request Card at page 18 and circle No. 327

# Mechanics' lien law

*This is the last in a series of articles on Construction Management by George E. Deatherage, P. E., The National Schools of Construction, Satsuma, Fla. The articles are based on an eight-volume "Manual of Advanced Construction Management" published by George E. Deatherage & Son, Construction Consultants, Satsuma, Fla.*

by GEORGE E. DEATHERAGE P. E.
construction consultant

The value of labor performed on any project, and the materials furnished for it, constitute debts by the owner, and payment can always be secured by a lien binding the real property as security for the value of labor or materials expended.

Lien laws vary from state to state. Taking California's as typical, we can outline, in broad terms, the general scope of such laws.

### Liens on real property

Land on which a project is constructed is subject to a lien if the land belongs to the person owning the project. If he owns less than fee-simple estate in the land, then only his interest in the land is subject to lien. Any building or other improvement or work is subject to lien, unless the owner gives notice—within 10 days after he knows about the work—that he will not be responsible for it. This notice is posted on the property, and a verified copy is filed in the office of the county recorder.

Direct liens are not, in the case of any claimants other than the contractor, limited as to amount by any contract price agreed on between the owner and contractor. But these liens cannot exceed the reasonable value of the labor done or materials furnished, or both, or the price agreed on for the work.

The owner's liability in all cases is limited to the measure of the contract price. Any contractor is entitled to recover upon a lien filed by him only such amount as may be due him according to the terms of his contract, after deducting all claims of other parties for work done and materials furnished.

In cases where a claim of lien is filed for work done or for materials furnished a contractor, the contractor defends any action brought, at his own expense. During such action, the owner may withhold from the contractor the amount of money for which the lien is filed. In case of judgment in such action against the owner or his property, the owner is entitled to deduct the amount of the judgment and costs from any amount due the contractor. If the amount is more than is owed the contractor, the owner can recover from the contractor or the contractor's bondsmen or sureties. Owners and contractors cannot, by the terms of their contract or in any other way, impair the claims and liens of other persons.

The liens provided for by this law are preferred to any lien, mortgage, deed of trust, or other encumbrance on the property which may have attached subsequent to the time when construction or improvement work started.

Mechanics, materialmen, subcontractors, teamsters, and others working on a project—with the exception of the contractor—may, at any time prior to the expiration of the period when claims of lien must be filed for record, give the owner a notice that they have performed labor or furnished materials or both and state the type and value of each. Such a notice must be verified by the claimant or someone acting in his behalf. It may be delivered to the owner, who withholds enough money from the contractor to answer the claim. In cases where work is being done for the state, or any public agency, the notice is filed in the office of the public disbursing officer who makes payments under the provisions of the contract.

If the money withheld is not sufficient to pay the demands of all persons giving notice, pro-rata distribution is made. However, nothing stands

(*Continued on next page*)

**Radio control keeps everyone on the go by keeping drivers in the know!**

What caused your last work stoppage? Could it have been prevented by radioing your foremen and supervisors the exact job condition—letting them send their trucks directly to areas where materials or equipment were needed immediately? How much time and money would you have saved? Take your own work. How much time can radio save you in conferring, checking, planning, and trouble shooting?

Ask a nearby Motorola 2-way radio user. Learn firsthand how you and your foremen can become more productive—saving miles and minutes with each 2-way radio message.

Why Motorola? You get highest dollar value! 1. A custom-planned system engineered to your specific requirements—Motorola assumes complete responsibility for your system. 2. The right equipment—from the world's most complete line of communications tools—Motorola has thousands of installations in every conceivable type of vehicle. 3. Unmatched reliability, proved by the majority of the nation's utilities, police, fire and transportation services—the professional buyers of 2-way radio. 4. Motorola service by factory-trained technicians from nearby maintenance centers—keeps your system at factory peak performance for long-lasting service and satisfaction. These are some of the reasons Motorola outsells all other makes combined!

Call your local Motorola Factory Sales Engineer—or write today to see how 2-way radio can most profitably serve you. For companies with operations abroad—Motorola sales and service are available in 50 countries throughout the world.

MOTOROLA 2-WAY RADIO
Motorola Communications & Electronics, Inc., 4501 Augusta Blvd., Chicago 51, Ill. • A Subsidiary of Motorola Inc.

For more facts, use Request Card at page 18 and circle No. 327

## Construction Camera

**Florida construction** stays in high gear. Ditch excavation is done by a Unit Model 1020-A dragline for a power line being constructed on Bird Key, an island subdivision located off Sarasota. A. A. Alderman Construction Co., Palmetto, Fla., is the owner of the rig.

**The job of turning taconite tailings pipe** to secure even abrasive wear lengthen its life is done by a Michigan 175A with a device attached fork ends. By means of a ratchet-and-pawl arrangement, the pipe is held place while it is turned. A 2-man crew handles lengths up to 1,200 feet.

**NEW detachable ALL-weather CAB for Hough PAYLOADER**

Enables your operator to work comfortably in all kinds of weather. Approved design for many Payloader models; fits perfectly, made of heavy gauge sheet steel and angle iron frame. Full vision SAFETY GLASS windows, mounted in rubber, right side and rear windows slide open for ventilation. Hinged door for easy access, may be removed for summer operation. Optional accessories include windshield wipers, heater-defroster, sun visor and rear view mirror. Campbell cabs are specifically designed for all Payloader models — see your Payloader distributor or write direct.

CAMPBELL detachable cab company
WAUCONDA, ILL.

For more facts, use Request Card at page 18 and circle No. 328

**COMPLETE, POWER and STEERING in ONE PACKAGE**

Harbormaster Marine Tractor Outboard Propulsion and Steering gives your craft rugged power, plus complete 360° maneuverability and the advantages of quick installation, operation and maintenance.

Harbormasters are complete units, easily installed for immediate use. They are ideal in shallow or deep water . . . for coastwise service as well as in harbors, lakes, canals, and rivers. Available with direct or remote controls.

*Harbormasters have been proved in hundreds of installations. Send for your copy of big, free catalog which gives complete details.*

**MURRAY & TREGURTHA, INC.**
44 Hancock Street • Quincy 71, Massachusetts

For more facts, use Request Card at page 18 and circle No. 329


## management

*(Continued from preceding page)*

in the way of any person who attempts to recover from the contractor or his sureties any deficit that may remain unpaid after pro-rata distribution of the money has been made. Anyone who gives a false notice of his claim to the owner forfeits all right to share in the distribution of the money and all right to any lien.

When claims of lien are being made on a project being financed by a construction loan, a stop notice is given to the mortgagee, beneficiary under deed of trust, or others holding funds to pay construction costs. They may withhold funds to answer such claims, but they are not required to do so unless the claimant files a bond equal in sum to 1¼ times the amount of the claim. This insures that, if the defendant recovers judgment, he will be reimbursed for all costs and damages in an action brought on the claim.

If the contractor, subcontractor, or other party against whom a claim is made disputes a claim, he can file a bond equal to 1¼ times the amount of the claim to guarantee payment in case the claim is upheld and to take care of the costs of a suit. When such a bond is filed, funds withheld by the lender—to satisfy a claim that may be upheld—are immediately released.

### Claims of lien

When improvement work is done under two or more original contracts, a notice of completion is filed in the office of the county recorder and signed and verified by the owner or by some other person on behalf of the owner. The contractor has 60 days after the filling of such notice, and all other persons have 30 days after the filing, to put in for a claim of lien.

If work stops on a project for a continuous period of 60 days, anyone wishing to make a claim has 90 days from the expiration of such 60-day period to do so. But if the owner files a notice of cessation after work has been stopped for a 30-day period, every original contractor has 60 days, and other claimants 30 days, in which to file a claim of lien.

The claim of lien is signed and veri-

Delivered early each morning to manufacturers' and distributors' hotel rooms

# On the Job Again

CONTRACTORS and ENGINEERS' AED CONVENTION DAILY . . . is fast becoming a tradition at the annual distributors' meeting. We're great respecters of tradition, so look for us to be on the job again next February in Los Angeles.

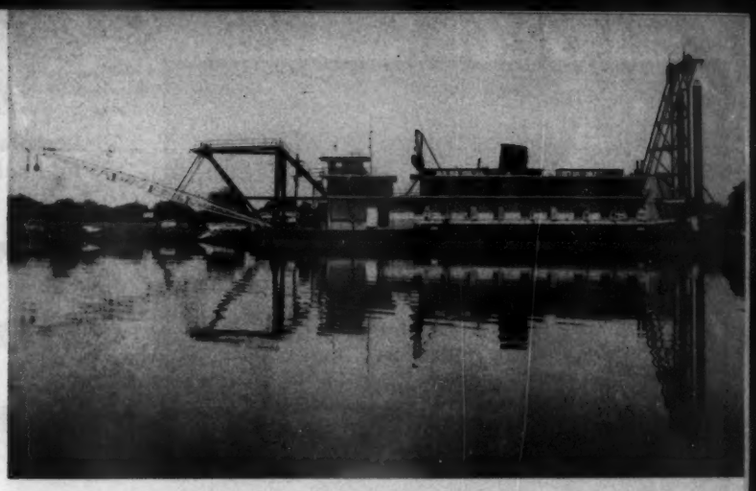
As before, the DAILY will be serving both distributors and manufacturers. In addition to covering convention sessions and providing vital news and features about the industry, our staff will be reporting product news from manufacturers' suites and CONDEX booths.

Manufacturers' advertisements — one of the most important features of each day's edition — again will stimulate distributor-manufacturer contacts, assuring a steady flow of visitors to manufacturer suites and exhibits.

And for the manufacturer who won't be in attendance, an advertisement in the DAILY is the best way of bringing his product message to the more than 2,500 dealers who will be on hand.

**CONTRACTORS and ENGINEERS**
470 Park Avenue South New York 16, N. Y.

**Barreling along** on the Regina-Cleft highway project in Idaho, this MRS 200 scraper is one of three used on the 650,000-yard grading operation by Morrison-Knudsen Co., Boise, Idaho. The rigs, repowered with GM Diesel 12V-71's before the start of the project, carry 50-ton loads.



**The 24-inch cutterhead dredge Parana,** with a rated maximum output of 2,100 yards per hour, is one of the dredges furnished Brazil by Ellicott Machine Corp., Baltimore, under a $5½ million contract for port development. It has a 70-foot ladder, digging depth of 46 feet, and can pump through a 9,000-foot line.

filed by the claimant or someone acting on his behalf, and contains a statement of his demand, after just credits are deducted; the name of the owner; a general statement of the kind of work done or materials furnished, or both; the name of the person by whom he was employed or to whom he furnished the materials; and a description of the property.

Mistakes in the statement of demand will not invalidate a lien, unless a court finds that the mistake was made with intent to defraud, or that an innocent third party has become the owner of the property and that the notice of claim was deficient.

No action to enforce payment of a claim is taken until the expiration of the period within which claims of lien must be filed for record. Nor can any suit be started later than 90 days following the expiration of such period. No money or bond is withheld by reason of any such notice longer than 90 days following the expiration of such a period, unless proceedings are started in court within that time by the claimant.

No lien binds any property for a longer period than 90 days after the lien has been filed, unless, within that time, proceedings are started in court. If a credit be given and notice of the fact and terms of such credit are filed in the office of the county recorder after the filing of a lien and before the expiration of the 90-day period, the lien continues in force until 90 days after the expiration of such credit, but no lien continues in force by reason of any agreement to give credit for a longer time than one year from the completion of the work.

Any number of persons claiming liens may join in the same action; when separate actions are started, they may be consolidated by the court. In addition to any other costs allowed by law, the court must also allow as costs the money paid for verifying and recording the lien.

The surety or sureties on any bond are not exonerated or released from the obligation of the bond by any change of any contract, plans, specifications, etc., nor by any conditions precedent or subsequent in the bond attempting to limit the right of recovery of laborers or materialmen.

THE END

# DIG TRENCH AND BELLHOLES IN SINGLE PASS

**The Cleveland JS-30 Trencher digs bellholes at pipe joints, digs flush to obstructions, slopes as it digs.**

Note the ample-width bellhole in the foreground above. The JS-30's exclusive power-shifted digging wheel shifts 2½ feet to each side of center to dig bellholes like this and to keep trench in line even when crawlers are being steered around side obstructions.

The JS-30's wheel power-*tilts*, too—saves blocking and cribbing when either crawler track is higher than the other on curbs, side slopes, etc.

Note, too, how the JS-30's power-shifted V conveyor with operator-controlled speeds up to 1,000′ per minute—another Cleveland exclusive—easily handled the big spoil volume from the wide-sloped trench. The JS-30 sloped the trench to 6′ top width as it dug.

**The JS-30 is a trencher of amazing utility —get all the facts now, from your Cleveland distributor.**

**CLEVELAND TRENCHER**

THE CLEVELAND TRENCHER CO., 20100 ST. CLAIR AVE., CLEVELAND 17, OHIO

For more facts, use Request Card at page 18 and circle No. 330

The 100-foot booms of two Universal tower cranes keep jutting skyward as the 16-story Comstock Apartments goes up on Nob Hill in San Francisco. Cranes usually work two floors from a setting; while one brings concrete from transit mixer to forms, another handles general lifting jobs. The third boom—90 feet long and with a 15-foot jib—belongs to an American truck crane feeding a hopper that supplies hand buggies. Buggies handle areas tower cranes cannot reach.

One of the big advantages of the tower crane: remote control of every movement of the rig. The operator, with an all-electric console suspended from a strap around his neck, is able to see the concrete bucket from loading point to spotting point. No hand signals are required, and instructions are easy to hear because of the quiet operation of the crane.

*Remote control and quiet operation add safety and convenience to job as*

# Two tower cranes handle materials for apartments

**Contractors and Engineers staff article**

Two Universal all-electric tower cranes, operated by remote controls, handled a major portion of the hoisting during construction of the 16-story Comstock Apartments, now nearing completion on Nob Hill in the heart of San Francisco. The $8 million cooperative apartment structure is being built by The Pacific Co., Engineers and Builders, Berkeley, Calif.

The contractor worked out a concrete-placing sequence that used two tower cranes and one truck crane, but left one of the tower cranes free for other hoisting jobs at all times. The sequence resulted in the placement of two complete floors—containing more than 1,400 cubic yards of concrete—every 21 working days. The last eight floors, each 20,000 square feet, were completed in 64 working days. This meant 8 days' work per floor.

The remote-control feature of the all-electric tower cranes was used to good advantage for a safer and more efficient operation. On all lifts, the operators were able to look over the edge of the building to their point of pickup and still be close to, and within full view of, the point where the load was to be placed. This eliminated the need for hand signals (and the signalmen), saved time, and made the operation safer than more conventional methods.

Many times, the operators were within speaking range of the men at the pickup or placement points and, since the electric machines are unusually quiet, could easily be heard. The quiet operation of the rigs was also a boon to the neighborhood, which is made up largely of apartment buildings.

### Floors have voids

The structure consists essentially of two garage floors and a terrace floor measuring 120 × 275 feet, surmounted by 12 typical apartment floors and a penthouse floor measuring 86 × 225 feet. The typical apartment floor contains 10 apartments.

The floor-to-floor vertical distance, except on the terrace floor, is 10 feet. This includes the 13-inch floor slab, which provides both the finished floor and the flat finished ceiling. All utilities are embedded in the slabs, which are cored with 8-inch circular voids spaced at 12-inch centers. The voids were created by Richvoid paper

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YOU CAN REALIZE **GREATER PROFITS**
...when you have your own welder on the job NO DELAYS

HOBART

200 amp. DC Small Shop "Husky Boy"

250 amp. DC "Contractor's Special"

200 amp. AC Power/DC Welder Combination

400 amp. DC Self-propelled "Big Wheeler"

Make your own weld repairs anywhere any time. Keeps equipment working. Save big money and costly delays by having a Hobart welder ready to work for you on a moment's notice. Easy to use—no special skill or training necessary.

A wide variety of gas and electric drive welders and models with auxiliary power allows you to pick the ideal unit for your work. Built-in extra features, at no extra cost, speed up welding, make tough jobs easy, improve operator's efficiency. Fill out and mail the coupon for complete details. HOBART BROTHERS CO., BOX 8120 TROY, OHIO, Phone FE 21223

*"Manufacturers of the world's most complete line of arc welding equipment."*

**TELL US YOUR REQUIREMENTS**

We'd like to be helpful in recommending the type welder best suited to meet your needs. No obligation, of course.

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Yes, I'd like to know more about these Hobart welders:
☐ "Husky Boy" ☐ "Contractor's Special" ☐ "Power/Weld" ☐ "Big Wheeler"
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Name_____
Address_____
City_____ Zone_____ State_____

For more facts, use coupon or Request Card at page 18 and circle No. 331

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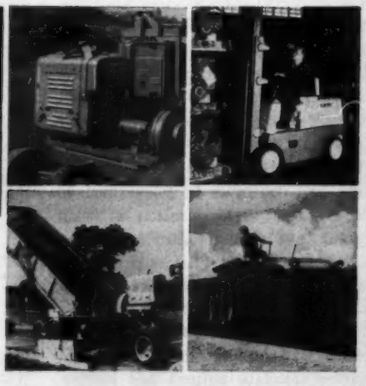

Rarely will you find an item of industrial, construction or road building equipment that won't run best and cheapest on Continental Red Seal power. The reason lies in specialization—in Continental's long-standing policy of engineering each model precisely to the work to be done. Whatever the machine . . . whatever its job . . . you can bank on it for abundant power at the speeds consistent with low fuel and upkeep cost.

Continental's ruggedness and rightness of design are helping to build prestige for more and more of the leading builders of specialized power equipment. It's wise when buying equipment of this type, to choose a make with dependable Red Seal power—power backed by specialized experience dating from 1902.

SERVICE AND PARTS AVAILABLE EVERYWHERE

Continental Motors Corporation
MUSKEGON • MICHIGAN

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THE ORIGINAL SPRAY STARTING FLUID*

Spanall joists are brought to the eighth-floor deck by one of the Universal Model 50HB's. One tower crane was always kept free for such hoisting work.

tubes placed in the forms.

The shear walls, which provide some of the vertical load transmission, as well as the resistance to lateral forces, are also the partition walls between the apartments. The columns are thin rectangular sections designed for a minimum projection outside the partition walls.

### Cranes in wells

The finished building has three elevators in the center, and a smoke tower (stairs). The vertical smoke-tower wells were used for mounting the two tower cranes. These cranes were Universal Model 50HB machines equipped with 100-foot booms and capable of lifting a load of 3,680 pounds at the 100-foot radius. They were completely electric in operation and had automatic cutoffs that acted to prevent them from picking up loads beyond their capacities.

Each crane was mounted on a 50-foot tower that extended down into the smoke-tower well at least two floors below the one on which the machine was working. Each tower rested on a collar of 8-inch wide-flange beams at the bottom and was

*(Continued on next page)*

This Universal tower crane is delivering concrete in a Gar-Bro ¾-yard bucket to the Gar-Bro 4-yard hopper where hand buggies pick up their loads. During concrete placing operations, one tower crane was always free to handle odd hoisting work.

A workman prepares to dump a concrete bucket into the twin hopper where buggies pick up their loads. The Homelite generator, foreground, provides power for vibrators consolidating the concrete. More than 1,400 yards of concrete was placed in two floors every 21 working days. This time was bettered on the last eight floors.


THE ORIGINAL SPRAY STARTING FLUID*

•Starts diesel and gasoline engines (from the smallest to the largest) down to 65° F. below zero • Starts in seconds • Excellent in humid weather too • Millions of cans sold •See your automotive jobber

*The inventors of spray starting fluid. Patent No. 2,948,595

Ask for the can with the "balky donkey" trademark

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P.O. Box 1988 • Camden 1, N.J.

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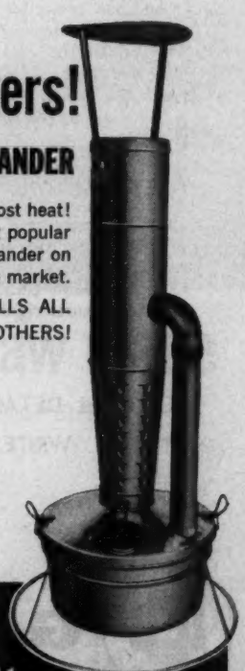
Low cost heat! The most popular Salamander on the market.
OUTSELLS ALL OTHERS!



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297 STOWELL STREET, UPLAND, CALIF.

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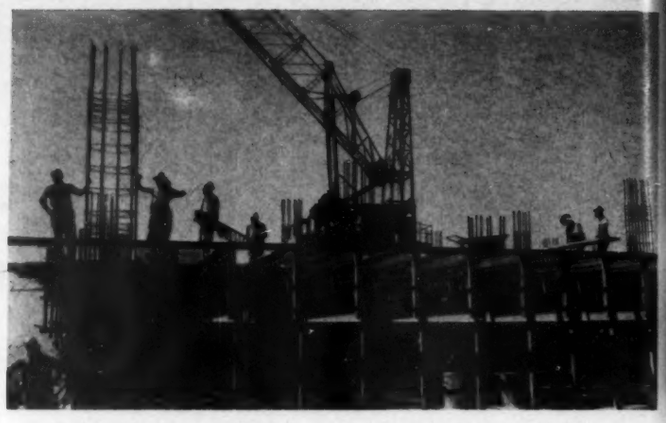
The 13-inch floor slabs incorporate 8-inch Richvoid tubes spaced at 12-inch centers. Workmen here are setting the adjustable screeds for striking off the concrete floor.



Deck forming is simple. The form system is shored on 4 × 4's with Ellis clamps. Spanall steel joists span between shores, and the Plyform deck panels rest on the Spanalls.

(*Continued from preceding page*)

shimmed against the sides of the smoke tower for stability. Temporary stairs were installed in the elevator wells.

The contractor usually built two floors from a single setting of the cranes. Then the lifting cables were reeved from anchors on higher floors through blocks at the bottom of the tower, and each crane raised itself two floors to a new working position —literally by its bootstraps.

At the conclusion of the job, the cranes were partly dismantled and lowered to the ground in sections weighing two tons or less.

The contractor used a simple deck-form system incorporating 4 × 4 wood shores with Ellis clamps, Spanall horizontal shoring, 2 × 4 flats, and ⅝-inch Plyform sheets. Walls and columns were formed with Plyform and 2 × 4's tied with West States (Los Angeles) snap ties.

The form components were raised from floor to floor by the tower cranes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*FOR FULL DETAILS, WRITE FOR BULLETINS.*

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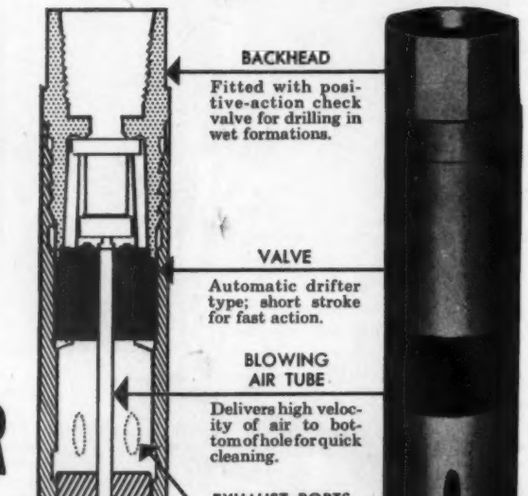
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Fitted with positive-action check valve for drilling in wet formations.
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BLOWING AIR TUBE
Delivers high velocity of air to bottom of hole for quick cleaning.
EXHAUST PORTS
Boost chips out of the hole.
HAMMER
Large bearing area for minimum wear on cylinder wall.
TAPPET BUSHING
Replaceable; keeps tappet in line for straight hole drilling.
CYLINDER
Clean, simple lines; carburized for maximum resistance to abrasions.
TAPPET
Bit screws directly onto tappet shank; bit replaced without disassembling drill.
BITS
Gardner-Denver "Molebits" in sizes from 4¾" to 8".

EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

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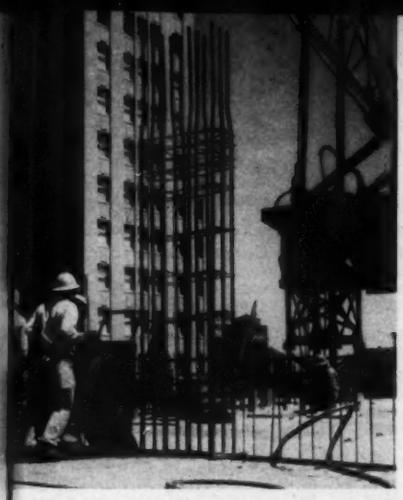

Concrete is hand-buggied to wall forms. In the background, a Homelite vibrator is being used to consolidate concrete.

and were quickly assembled by a relatively small forming crew. With the deck forms in place, the lower mat of reinforcing steel was placed by the steel subcontractor, Herrick Iron Works, Oakland. After the crew placed and anchored the 8-inch paper cylinders, the top reinforcing was set. All of the electrical and mechanical ducts were incorporated in the floor slab, since there are no false ceilings in most floors of the structure.

**Concrete-placing sequence**

Each floor slab was divided into three increments for concrete placement. In addition to the slabs, there were many walls and columns; some kind of concrete placement was done practically every working day.

Each of the two end sections of the typical floors contained 222 cubic yards of concrete while the central section required 158 yards. Placement for each of these large sections was made with the use of one of the tower cranes, plus a truck crane. The tower cranes raised the concrete from the transit mixers at ground level in Gar-Bro ¾-yard buckets. This concrete was placed directly into the forms over the area that could be reached by the 100-foot booms.

A truck crane, standing on the ground beside the building, raised some of the concrete to a Gar-Bro 4-yard hopper on the deck. This concrete was hand-buggied to those areas of the deck beyond the reach of the tower cranes. For the first five floors, the contractor used an American 25-ton truck crane fitted with 90 feet of boom and 15 feet of jib. Then this machine was exchanged for a P&H 70-ton crane with 210 feet of boom and jib that enabled it to reach to the top slab, 158 feet above the street.

With this placing sequence, one of the tower cranes was always available to raise materials, reinforcing, etc.

The concrete was vibrated with Homelite vibrators powered by Homelite portable generators. The concrete floors were finished by Rex and Whiteman power finishing machines.

The job was supervised for The Pacific Co. by superintendent Ed Thompson. The structure was designed by Hammarberg & Herman, architects, El Cerito, Calif., and is being built for the Bay City Developers. THE END

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**Winslow TRUCK SCALES** PIT AND PITLESS TYPES

Capacities: 15, 18, 20, 30, 40, 50, 60 and 70 tons.

For use at temporary and permanent locations, stockpiles, and by bituminous material contractors at the jobsite.

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# New! Biggest capacity 10" saw made

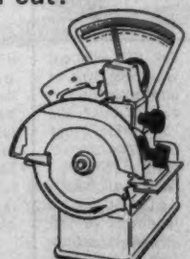
## SKILSAW Super Duty Model has full 3¾" depth of cut!

If you don't think there's a big difference in saw capacities, try cutting 4-inch dressed lumber with any other 10-inch saw. The 860, with full 3¾-inch depth of cut, does it with blade to spare.

This super-duty, high speed saw is not only rugged as they come, it's the lightest 10" saw made. Super safe, too, because of Skil's "Floating" Guards*. Both lower and upper guard automatically adjust to cover blade at every cutting depth. Vari-torque clutch protects against kickbacks.

Ask your Skil distributor for a demonstration. Look under "Tools-Electric" in the Yellow Pages. Or write: Skil Corporation, 5033 Elston Avenue, Chicago 30, Illinois, Dept. 107L.

*Patent applied for



25% lighter—only 17½ lbs.

SKIL ...and SKILSAW POWER TOOLS

# Product LITERATURE

***To obtain free copies of any of the literature described in the following section, circle the designated number on the Request Card at page 18.***

**Two-way radio**—a brochure on Motorola's new transistorized Motrac 2-way radio line. Contains complete explanations and illustrations of the benefits made possible through the incorporation of transistors in the new unit, such as low current drain, compactness, reduced maintenance, and high audio power.

Write to Motorola, Inc., Communications and Industrial Electronics Division, Dept. C&E, 4501 W. Augusta Blvd., Chicago 51, Ill., or use the Request Card at page 18. Circle No. 122.

**Aggregate spreader**—a booklet describing the benefits of the Flaherty Spread-Master, a self-propelled power spreader for surface-treatment and seal-coat operations. Points out that the machine has the power and capacity to handle tandem-axle trucks, as well as other types, without alterations or attachments. Illustrated with drawings and photographs.

Write to Flaherty Mfg. Inc., Dept. C&E, Pocatello, Idaho, or use the Request Card that is bound in at page 18. Circle No. 23.

**Pile hammers**—a bulletin describing McKiernan-Terry's line of six single-acting pile hammers for steam or air operation. Covers standard attachments, bearing calculation charts, and hammer operation. Bulletin No. 691.

Write to the McKiernan-Terry Corp., Dept. C&E, 100 Richards Ave., Dover, N. J., or use the Request Card at page 18. Circle No. 88.

**Crane-excavator**—illustrated literature describing the Unit Model 614, a ½-yard crane-excavator convertible to dragline, trench hoe, and clamshell. Covers such features as interchangeable disk-type clutches, straight-in-line engine mounting, traction brakes, and full-vision cab.

For further information write to the Unit Crane & Shovel Corp., Dept. C&E, 6411 W. Burnham St., Milwaukee, Wis., or use the Request Card at page 18. Circle No. 83.

**Boring unit**—a bulletin on the KA-MO E300 electric-powered boring unit. Describes vertical, horizontal, or angular boring, and is illustrated with on-the-job photographs.

Write to the Kwik-Mix Co., Dept. C&E, 235 W. Grand Ave., Port Washington, Wis., or use the Request Card at page 18. Circle No. 64.

**Subdrainage pipe**—a catalog describing the advantages of perforated corrugated pipe for subdrainage. Illustrates simple installation of perforated pipe, and points out that steel pipe requires practically no trenching care, reduces the number of joints, and can be joined with simple band couplers fabricated to fit either helical or straight corrugations. Also describes a new line of wedge fasteners that speed pipe installation and reduce material cost.

Write to Armco Drainage & Metal Products, Inc., Dept. C&E, 9360 Curtis St., Middletown, Ohio, or use the Request Card at page 18. Circle No. 57.

**Salamander**—literature on the recently introduced Hauck Little Giant salamander. Lists various applications for the portable gas-burning unit, and describes its features. Specifications. Sheet No. GB130FA.

Write to the Hauck Mfg. Co., Dept. C&E, 124–136 Tenth St., Brooklyn 15, N. Y., or use the Request Card at page 18. Circle No. 66.

**Asphalt plants**—a 32-page illustrated brochure describing the full Barber-Greene line of automatic BatchOmatic, semiautomatic, and power-control asphalt batch plants. Lists a dozen or more engineering and

THESE VERSATILE FORMS insure uniform, accurate product pre-casting on a mass production basis. Square piling forms with form-lock are available in either single or dual forms.
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*Time is what you save when you cast prestressed* members with FMC's new line of steel forms for 1960. Time in terms of faster stripping, faster resetting and fewer man hours per job. FMC has introduced many refinements to the pioneer line of steel forms, refinements that make them now, more than ever, the way to cast—at a profit. New form-lock for fast and perfect alignment, and new tilt back-designed forms for quick product removal are only a few of the features that make Form-Crete forms your best bet. Clip the coupon and get the full story from your local Form-Crete man.

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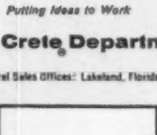
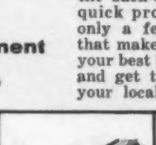
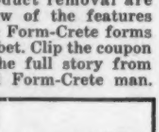
FOR USE with any acceptable type of prestressing in current practice, the Form-Crete Bridge Beam form complies with joint P.C.I.—AASHO—recommendations. Form lengths in 10 foot sections, combinations up to 60 feet.


HOLLOW PILINGS are easily cast in these octagonal piling forms by use of tubing and piling headers. Unique tilt back design permits fast, easy product removal, cleaning and oiling of forms.


CHANNEL FORMS, with patented form-locks which allow sides to flex for quick and easy removal of product. Self-contained channel understructure insures extra rigidity and strength in this outstanding form.


FORM-CRETE LEDGER BEAM FORMS provide fast, accurate casting of roof support beams. Riser blocks can be employed to vary depth of beam; forms are lock-up type with reinforced self aligning pilot liners.

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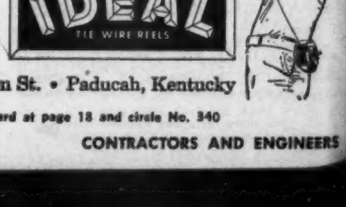


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design features, most of which are common to all types and sizes.

Write to the Barber-Greene Co., Dept. C&E, 400 N. Highland Ave., Aurora, Ill., or use the Request Card at page 18. Circle No. 123.

**Dumper**—a brochure on the Mack Model M-30X 30-ton dumper. Emphasizes the extra-heavy-duty design of the truck's structural components. Specifications furnished. Photographs.

Write to Mack Trucks, Inc., Dept. C&E, 900 North Ave., Plainfield, N. J., or use the Request Card at page 18. Circle No. 90.

**Dredge ownership**—a technical report telling how Suffolk County, N. Y., completed 22 separate dredging projects in three years with the Ellicott Shinnecock, a 12-inch hydraulic pipeline dredge. Gives specific figures for total cubic yards moved and total operational costs per cubic yard for the 3-year period, and describes how the county was able to accomplish more work at less cost with its own dredge. Illustrations include a map of Long Island showing the location of the 22 projects.

Write to the Ellicott Machine Corp., Dept. C&E, 1611 Bush St., Baltimore 30, Md., or use the Request Card at page 18. Circle No. 124.

**Road stabilization**—a booklet explaining how gravel, slag, and stone can be transformed through stabilization into low-cost, maintenance-free roads. Fully illustrated text outlines three stabilization techniques. Bulletin No. 1042.

Write to the American-Marietta Co., Construction Equipment Division, Dept. C&E, 13050 Blue Mound Road, Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 125.

**Motor graders**—an illustrated booklet detailing the construction and operating features of Huber-Warco Model 6-D and 7-D motor graders with torque converter and power-shift transmission. Brief data on other Huber-Warco equipment also included. Bulletin HWG-521.

Write to the Huber-Warco Co., Dept. C&E, Box 501, Marion, Ohio, or use the Request Card at page 18. Circle No. 87.

**Pumps**—a booklet on Jacuzzi portable self-priming contractors' pumps offering capacities up to 200,000 gph. Photographs and specifications for each unit. Bulletin No. JCP-1.

Write to Jacuzzi Bros., Inc., Dept. C&E, Jacuzzi Ave., Richmond, Calif., or use the Request Card at page 18. Circle No. 86.

**Truck mixer**—a brochure discussing the construction and operating characteristics of the Challenge Custom 4 engine-takeoff-drive mixer designed especially for half-cab trucks. Describes and illustrates such features as complete mixer control from inside the cab, Electro-Aire controls, and 4-speed operation.

Write to Challenge-Cook Bros., Inc., Dept. C&E, 3334 San Fernando Road, Los Angeles 65, Calif., or use the Request Card at page 18. Circle No. 126.

**Gun plastic cement**—an illustrated booklet on the use and application of Riverside gun plastic cement. Subjects covered include mixes, additives, protection and curing.

Write to the Riverside Cement Co., division of American Cement Corp., Dept. C&E, 621 S. Hope St., Los Angeles 17, Calif., or use the Request Card at page 18. Circle No. 71.

**Motor grader**—production figures on Caterpillar's No. 14 motor grader. The weight, traction, speed, and power of the No. 14 are credited with increasing production on jobs from Florida to Canada, according to the booklet. Specific jobs are cited; mechanical features of the machine covered. Form DE005.

Write to the Caterpillar Tractor Co., Dept. C&E, Peoria, Ill., or use the card at page 18. Circle No. 68.

**Ice melting**—a pamphlet entitled "How to use Chemical Mixtures in Winter Maintenance Work." Designed to aid maintenance workers, the literature describes the proper method of mixing and spreading bulk calcium chloride and bulk salt. Illustrated.

Write to the Calcium Chloride Institute, Dept. C&E, 909 Ring Bldg., Washington 6, D. C., or use the Request Card at page 18. Circle No. 44.

**Finisher**—a fact sheet on the Koehring transverse finisher. Details operating and construction characteristics; gives condensed specifications. Text illustrated with photograph and dimensional drawing.

Write to the Koehring Division, Koehring Co., Dept. C&E, 3026 W. Concordia Ave., Milwaukee 16, Wis., or use the Request Card at page 18. Circle No. 61.

**Squirt welder**—a bulletin describing operating features, construction details, and application information on a new trackless carriage for Lincoln's semiautomatic squirt welder. Photographs, drawings, and specifications. Bulletin 5205.2.

Write to The Lincoln Electric Co., Dept. C&E, P. O. Box 3115, Cleveland 17, Ohio, or use the Request Card at page 18. Circle No. 105.

**Sandhog equipment**—a bulletin describing a wide variety of Mayo sandhog equipment. Covers installations of man locks, muck locks, tunnel shields, air locks and lock doors, grouters, and pea-shooter cars, as well as many types of tunnel cars and allied equipment. The Scott tunnel excavator is also illustrated.

Write to Mayo Tunnel & Mine Equipment, Dept. C&E, Box 1413, Lancaster, Pa., or use the Request Card at page 18. Circle No. 106.

**Roller**—an illustrated fact sheet describing the Buffalo-Springfield Model PSR-9 3 to 10-ton pneumatic-tire roller. Contains condensed specifications and a table of weights and compressions. Bulletin B627-1.

Write to the Buffalo-Springfield Co., Dept. C&E, 1210 Kenton St., Springfield, Ohio, or use the Request Card at page 18. Circle No. 101.

**Backhoe attachments**—a bulletin covering all backhoe attachments and options for the company's crawler-mounted, carrier-mounted, and self-propelled crane-excavators. Specifications and work ranges are described; standard and long-boom backhoes, and hydraulic, V-type, and rock buckets are illustrated. Bulletin No. BH-60-1.

Write to Schield Bantam Co., Dept. C&E, 219 Park St., Waverly, Iowa, or use the Request Card at page 18. Circle No. 127.

**Load-span tables**—a load-span catalog section covering precast-concrete roof and floor channels. Covers standard 24-inch-wide channel with nominal 4, 6, 8, and 12-inch depth. Each page illustrated with a dimensional drawing of the channel cross section. The formula used in figuring loadings is also included.

Write to the George Rackle & Sons Co., Dept. C&E, Newburg Station, Cleveland 5, Ohio, or use the Request Card at page 18. Circle No. 128.

**Space heaters**—a bulletin describing Perfection's MH series of mobile multi-fuel space heaters. Covers Models MH-15, MH-30, and MH-60. Bulletin MA9A1.

Write to Hupp Corp., Perfection Division, Dept. C&E, 1135 Ivanhoe Road, Cleveland 10, Ohio, or use the Request Card at page 18. Circle No. 80.

**Concrete spreader**—a bulletin on the Rex Model PW concrete spreader designed to permit width changes from 10 to 15 feet and 12 to 18½ feet while on the move. Specifications furnished. Bulletin No. 60-152.

Write to the Chain Belt Co., Dept. C&E, 4701 W. Greenfield Ave., Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 129.

**Prestressing system**—literature describing the benefits of the Prescon prestressing system. Fundamentally, the booklet points out, the system utilizes cold formed heads on high-carbon steel-wire tendons to provide positive end anchorage. Photographs illustrate a variety of Prescon applications. Charts, spex also included.

Write to The Prescon Corp., Dept. C&E, P. O. Box 4186, Corpus Christi, Texas, or use the Request Card at page 18. Circle No. 12.

**Powder-actuated tools**—a file folder containing data prepared by member companies of the Powder Actuated Tool Manufacturers' Institute. Each company provides a basic brochure describing its tools for fastening wood to concrete, steel to concrete, and steel to steel. Includes information on sizes and specifications, performance characteristics, and optional equipment. Illustrations.

Write to the Powder Actuated Tool Manufacturers' Institute, Inc., Dept. C&E, 200 College St., New Haven, Conn., or use the Request Card at page 18. Circle No. 20.

**Mixers**—a folder describing Praschak batch mixers offered in models with capacities of 8, 16, 21, 30, 50, and 75 cubic feet. Text illustrated with photographs. Prices listed.

Write to the Praschak Machine Co., Dept. C&E, Marshfield, Wis., or use the card at page 18. Circle No. 11.

**Soil-cement paving**—a booklet describing the Sta-bilt method of soil-cement paving. Explains the equipment, sequence of operation, and principles involved in this method of constructing roads. Bulletin 1002.

Write to the Construction Equipment Division, American-Marietta Co., Dept. C&E, 13050 Blue Mound Road, Milwaukee 1, Wis., or use the card at page 18. Circle No. 130.

*(Continued on next page)*


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**Truck crane**—a catalog describing the newest addition to Link-Belt's Zephyrcrane line, the 25-ton HC-77 truck-crane. All major features are illustrated and fully described, including those on the carrier, which is also designed and manufactured by Link-Belt. Crane attachment and all related features covered. Catalog 2988.

Write to the Link-Belt Speeder Corp., Dept. C&E, 1201 Sixth St. S.W., Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 42.

**Dragline bucket**—a brochure covering the Page Dual-Hitch automatic dragline bucket. The Dual-Hitch is said to be easily adjusted in minutes to dig at any desired depth above or below the fair lead with the same degree of efficiency and capacity. Action photos; close-ups of important features. Brochure No. DH-360.

Write to the Page Engineering Co., Dept. C&E, Clearing Post Office, Chicago 38, Ill., or use the Request Card at page 18. Circle No. 48.

**Surveying instruments**—Keuffel & Esser's pocket-size 192-page "1960 Solar Ephemeris and Surveying Instrument Manual." Presents full details and operating procedures for all basic surveying instruments; covers use, care, maintenance, disassembly, and adjustments. Entire section devote to solar ephemeris. Well illustrated with diagrams, charts, and schematic drawings.

Write to the Keuffel & Esser Co., Dept. C&E, Adams and Third Sts., Hoboken, N. J., or use the Request Card at page 18. Circle No. 85.

**Winter driving**—a new booklet designed to help operators of trucks overcome the hazards of winter driving. Outlines the six major hazards, including increased braking distances and the effect of temperature on starting and stopping. Includes test facts on jackknifing and its prevention, as well as advice on how to maintain control in skids. Use of tire chains is also discussed—and strongly urged.

Write to the National Safety Council, Dept. C&E, 425 N. Michigan Ave., Chicago 11, Ill., or use the Request Card at page 18. Circle No. 26.

**Welding alloys**—a 56-page welding, brazing, and soldering alloy and flux catalog and instruction manual. Covers physical properties, major uses, detailed application instructions, and the latest techniques for welding, brazing, soldering, cutting, and hardfacing. Helpful charts and tables included. Also available in Spanish.

Write to the All-State Welding Alloys Co., Inc., Dept. C&E, 249-55 Ferris Ave., White Plains, N. Y., or use the Request Card at page 18. Circle No. 131.

**Structural-steel components**—a bulletin describing Commercial above-ground and underground structural-steel components. Covers liner plates, ring wales, anchor bolts and tie rods, cold bent roof supports, and ribs and posts. Illustrated with nine case-history photos. Bulletin 300-P14.

Write to the Commercial Shearing & Stamping Co., Dept. C&E, 1775 Logan Ave., Youngstown 1, Ohio, or use the Request Card that is bound in at page 18 of this issue. Circle No. 132.

**Concrete additive**—a fact sheet discussing Crown Zellerbach's Zeecon, a dispersant for concrete additive formulations. Lists such benefits as reduced water requirements, improved workability, more compressive strength, and reduced permeability and water absorption of hardened concrete.

Write to the Crown Zellerbach Corp., Chemical Products Division, Dept. C&E, Camas, Wash., or use the Request Card at page 18. Circle No. 133.

**Trailers**—literature describing the Rogers Model HFT-25 and HFT-25T1 25-ton-capacity High-Flat trailers. Also gives information on extendible models. Specifications and photographs.

Write to the Rogers Bros. Corp., Dept. C&E, 108 Orchard St., Albion, Pa., or use the Request Card at page 18. Circle No. 36.

**Core-drill rig**—a bulletin on the Acker Presidente, a versatile core drill designed for drilling to depths of 4,500 feet. Fully describes the rig's special features, as well as some related accessories. Bulletin 31.

Write to Soiltest, Inc., Dept. C&E, 4711 W. North Ave., Chicago 39, Ill., or use the Request Card at page 18. Circle No. 53.

**Dam concreting**—literature describing the design and placement of more than 500,000 cubic yards of concrete for the huge Tri-Dam project. Covers mix design, placing techniques, and quality control in some detail. Gives information on how $86,000 was saved through the design of the various concrete mixes. Bulletin P-75.

Write to The Master Builders Co., Dept. C&E, 2490 Lee Blvd., Cleveland, Ohio, or use the Request Card at page 18. Circle No. 104.

**Lime stabilization**—a booklet explaining the advantages of lime as a stabilizing additive in road construction. Fully illustrated, it covers subbase and base construction, as well as the mixing and compacting equipment used. Bulletin 1012.

Write to the Construction Equipment Division, American-Marietta Co., Dept. C&E, 13050 Blue Mound Road, Milwaukee 1, Wis., or use the card at page 18. Circle No. 134.

**Heaters**—a bulletin describing the MH Series of Perfection mobile heaters. According to the literature, these heaters operate on any common liquid fuel such as gasoline, kerosene, fuel oil, diesel oil—even crankcase drainings. Lists detailed specifications and dimensions for three models.

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**Multi-arc welding**—a folder discussing the benefits of Nottingham multi-arc welding systems. Includes data on transformer-rectifier power units, welding control resistor units, and welding-system distribution panels and connectors. Photographs illustrate text.

Write to J. B. Nottingham & Co., Inc., Dept. C&E, 441 Lexington Ave., New York 17, N. Y., or use the Request Card at page 18. Circle No. 27.


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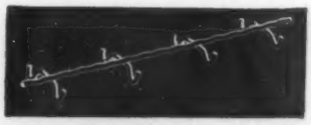

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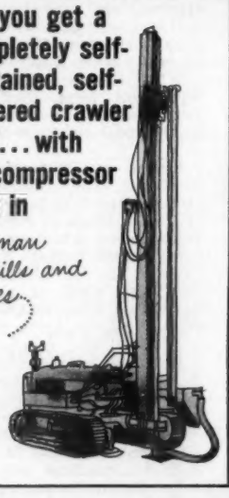

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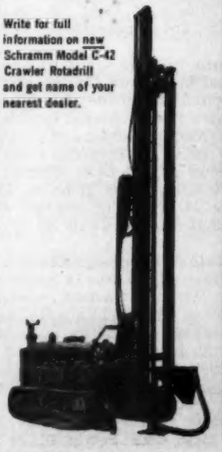

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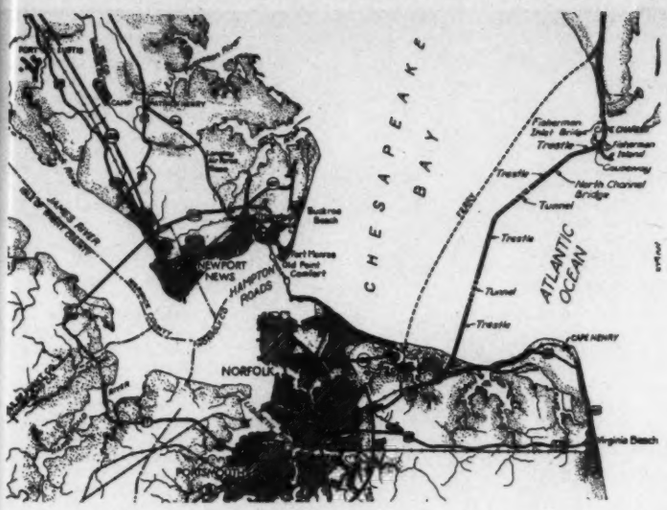



## Bridge-tunnel crossing for Chesapeake Bay

■ The world's longest bridge-tunnel crossing, running 17½ miles across the mouth of the Chesapeake Bay near Norfolk, Va., moved a step closer to actuality with the underwriting of a $200 million revenue bond to finance the work. The project is expected to be completed in about three years, and construction costs are estimated at $139 million.

Cape Charles, Va., and Chesapeake Beach near Norfolk will be joined by two tunnels, two steel bridges, a causeway, and 11.6 miles of precast, prestressed-concrete trestle. The crossing, which will include three artificial islands, will become part of a new coastal highway between New England and Florida.

Drivers from Norfolk will start the crossing on a trestle that will end on an artificial island. There a tunnel leads under Thimble Shoal Channel to another artificial island, where a trestle carries the road to a second tunnel under the Baltimore Channel. Drivers emerge from this tunnel onto a third artificial island and proceed by trestle and a bridge spanning the North Channel to Fisherman Island. A causeway carries the crossing over Fisherman Island, and a bridge spanning Fisherman Inlet leads to the end of the crossing and the approach road to Wise Point on Cape Charles.

A joint venture of Merritt-Chapman & Scott Corp. and Raymond International Inc., both of New York City; Tidewater Construction Co., Norfolk, Va.; and Peter Kiewit Sons' Co., Omaha, Nebr., is handling construction of the tunnels and trestle. American Bridge Division of U. S. Steel Corp. holds the contract for the two bridge superstructures.

Sverdrup & Parcel, consulting engineering firm of St. Louis, designed the crossing and will provide engineering supervision for the job.

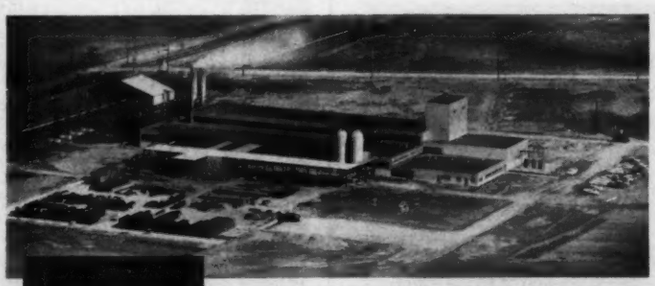
## New BPR bulletins on bridges, vehicles

■ Two new bulletins have been published by the Bureau of Public Roads.

"Hydraulics of Bridge Waterways," the first of a proposed series on hydraulic design of highway drainage structures, is intended to provide a means of computing the effect of a given bridge upon the flow of the stream it will span. Chapters in the 53-page illustrated booklet cover: computation of backwater; extent of backwater; difference in level across approach embankments; dual bridges; abnormal stage-discharge condition; effect of scour on backwater; illustrative problems; and limitations of data. The price of the bulletin is 40 cents.

"Classification of Motor Vehicles, 1956–57," gives detailed information on the number of registered vehicles in 1956, with an estimate for 1957. The vehicles are classified according to type, kind of fuel used, gross vehicle weight, and use. Of particular interest to highway engineers and administrators are tabulations by states, and conversion tables relating empty vehicle weight to probable gross vehicle weight. This bulletin is priced at 75 cents.

Copies of both of the bulletins may be obtained from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

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# Tower draglines build earth dam

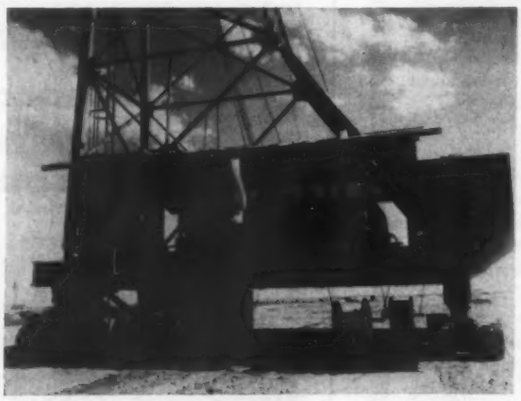
Three of the four Sauerman tower draglines on Willard Dam —a 15-mile-long dike that will impound irrigation water at Great Salt Lake—scoop up lake-bottom material to bring the structure within 13 feet of its 35-foot height. About 2.2 million yards of borrow for the base was placed under another contract. Each tower, 100 feet high, has cables running 900 to 1,000 feet to a tail tower anchored on the mud flat.

Four Sauerman tower draglines equipped with 5-yard buckets are digging 24 hours a day, 6 days a week, to scrape up 10 million cubic yards of lake-bottom deposit to build a huge dike known as Willard Dam at Great Salt Lake in Utah. Converting the wet mud into a stable earth-fill structure is no small accomplishment.

Willard Dam, an element of the Bureau of Reclamation's Weber Basin Project, is actually an earth dike some 15 miles long, built on a mud flat on the east side of Great Salt Lake near Willard. The rolled-earth embankment, which will have a maximum height of 35 feet, surrounds the reservoir except where it abuts high ground on the east side.

The reservoir will have a capacity of 215,000 acre-feet and will be filled by diverting water from the Weber River through the Willard Canal during periods of high flow. The water will be pumped back out of the reservoir as needed to irrigate agricultural land along the east side of the lake.

The current $5 million contract for Phase II of the earthwork is being done by George M. Brewster & Son, Inc., Bogota, N. J. This is actually the third contract since the work was started in 1957. The first operation was the construction of a dike around the area to keep out the lake water.



A big GM 12V engine powers the Sauerman 3-drum hoist. The box at right carries counterweights. Towers ride on Athey tracks.

Operators tighten tension lines and shake the Crescent bucket to dislodge the sticky mud.

The second contract, for the first phase of the earthwork, was done by a joint venture of M. H. Hasler Construction Co. and H. C. Smith Construction Co., Los Angeles. This $1.1 million job involved the placing of about 2.2 million cubic yards of borrow in a wide base pad over a portion of the length of the dam.

Brewster's contract completes this pad and brings the structure up to a uniform elevation of 4221, which is 13 feet below the final finished grade.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***Long earth dike at Great Salt Lake will create fresh-water reservoir for irrigation purposes***

Early in the job, material was dragged up into big piles, but it did not dry well and was troublesome to spread. This Euclid TC-12 tractor-dozer is trying to lay some of the partially dried material from one of the piles.

Material spread by a dozer is compacted by this Cat D8 with sheepsfoot roller. The Sauerman draglines are working on the dike in the background.

One of the big haul units delivering impervious borrow material drops its load on the run. The current contract calls for completion of the base pad and the building up of the dike to within 13 feet of the finished height.

A No. 14 motor grader—one of a pair being used to maintain haul roads—is also kept working to spread materials delivered by trucks from a borrow pit on the shore.

There will be one future earthwork contract to complete the structure.

The base of the structure is the pad of material, 6 feet deep and 400 feet wide, laid down on the mud flat. The central 180 feet of the pad is select impervious borrow, which forms the base for the succeeding lifts of the structure. On the outside of this core is a 30-foot zone of pervious material. The remainder of the pad is unselected material 120 feet wide on the inside of the reservoir and 65 feet wide on the outside.

The structure above the pad is being built of the lake-bottom material pulled up from the reservoir area by the tower draglines. It must be dried, spread, and compacted to form the dike.

**Building the base pad**

Under the Phase I earthwork contract, Hasler-Smith brought the pad out from high ground at the northeast corner about four miles, or approximately one-third the length of the structure. Most of the material for this phase came from a borrow pit, which was an area being prepared for the relocation of pipelines, transmission towers, and highway. The area ranged from 400 to 600 feet wide and was 7,000 feet long. The average depth of cut was about 17 feet, with the maximum as much as 32 feet.

Subsurface water in this borrow pit caused a real headache for this contractor. Crews first dug four big ditches through the pit and one along the east side to intercept the water and lead it away. Still the sand and clay material remained practically saturated. A big plow that was pulled by D8 and D9 tractors was used to turn over 4½-foot furrows of the material to aerate it and speed its drying.

As soon as this material could be handled, it was loaded by a spread of 11 Caterpillar DW20 scrapers that had been enlarged and beefed up by the Wheeler Machinery Co., Salt Lake City, to a capacity of 26 yards struck. The scrapers were push-loaded by tandem D9's, and it took all the power of the DW20 and two D9's, plus some skillful operation, to load the scrapers efficiently and keep from getting bogged down.

Once loaded, the scrapers had a


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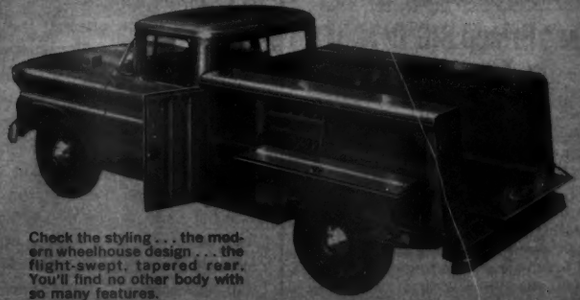

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The joint-venture contractors working on the first phase of the earthwork operations built up about 4 miles of a wide base for the 15-mile dike. This Cat DW20 is hitting about 35 mph on the 1½-mile dead haul from the center of the borrow pit to the beginning of the fill.

Loading from the wet borrow pit was a tough job. DW20's, enlarged to a 26-yard struck capacity, are push-loaded by two D9's in tandem. The pit was first drained with a series of ditches, then plowed so that the material could dry. Scrapers took what was dry, and the plow went back to turn over some more material.

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(*Continued from preceding page*)

long and level haul on a wide, well maintained haul road, and they hit speeds in excess of 30 mph. It was a mile and a half from the center of the pit to the beginning of the embankment, and another four miles to the end. The average haul was something in excess of three miles each way.

Hasler-Smith first built a pad to support the heavy equipment and then added the remaining fill in shallow lifts. They found that a pad 3 to 4 feet thick was required to hold up the heavy traffic. To build this, the scrapers dumped as close to the end of the fill as possible, often requiring the aid of a dozer in dumping. Then the dozer pushed the material on out over the mud of the lake bottom.

As soon as this first lift was built, the scrapers began dumping thin lifts at high speeds. Without stopping, they spread their loads over the pad and swung back toward the pit. Dozers and motor graders shaped up the material and kept the roads maintained. This heavy traffic, well spread over the area, provided sufficient compaction for most of the pad.

**Phase II earthwork**

Under the Phase II contract, Brewster is completing the base pad, as well as building an average of 15 feet of height for the superstructure.

From a borrow pit near the northeast end of the dam, Brewster's spread of Cook Bros. Earth King trucks, augmented by some hired haul units, is handling the zone 1 impervious core material for the dike. These rigs are loaded by a DoMor elevating grader on a Caterpillar No. 14 motor grader. The big haul rigs really roll over the long stretch of level haul road, delivering 25 or more yards of material per trip. The bottom-dump rigs drop their loads, with only a moment's halt, and then speed back to the pit for refills.

The gravel for the zone 2 section of the pad is being furnished and placed by a subcontractor, Miles & Sons, Inc., Merced, Calif. This material is being loaded by dozers and a belt loader to a fleet of haul units similar to those hauling the zone 1 material.

Working on the previously built base pad, the four Sauerman tower

(*Continued on page 100*)


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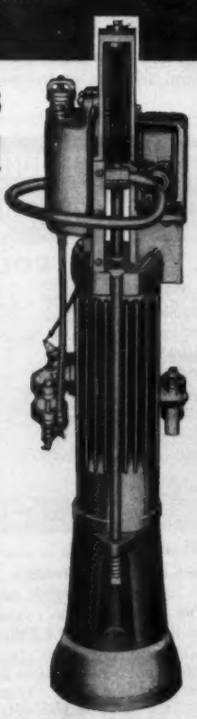

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High degree soil compaction is worth every cent it costs. Barco Rammers are especially effective for compacting fill in restricted areas—close to walls, culverts, abutments, around footings, and in trenches.

**ONE MAN OPERATION**—On area tamping, one man can average 20 to 30 cubic yards of fill per hour. On 18" trench backfill, using lifts up to 24", the rate is 360 to 600 feet per hour.

**ASK FOR A DEMONSTRATION**—We will be glad to arrange a demonstration for you; see our nearest distributor or write.

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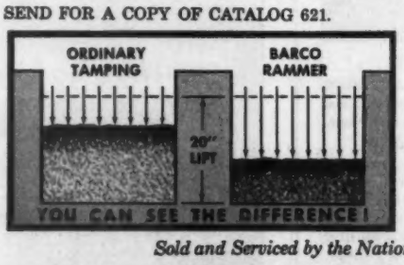


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**BARCO-VIBRA TAMP** *for Granular Fill and Bituminous Surfacing*

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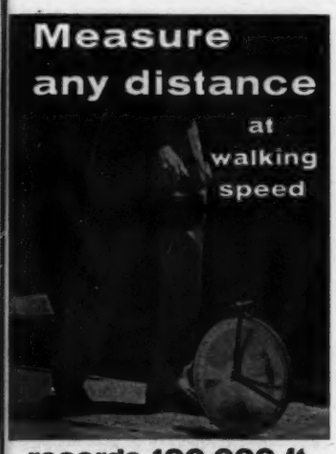


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"Before using LUBRIPLATE, we replaced the wheel bearings in over 50% of our trucks each year. Since using it, bearing replacements have dropped to less than 10%. We have also been able to increase periods between chassis lubrications from 500 to 2000 miles. We are very happy over our change to LUBRIPLATE, and heartily recommend it to fleet operators interested in saving money."

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For more facts, circle No. 354

Regular lubrication was an important part of the work on the Hasler-Smith job. The grease rig lubricating one of the Cat scrapers is equipped with Lincoln pumps and reels and carries a Westinghouse air compressor.

(Continued from page 98)

draglines scoop up material from the reservoir area to build up the structure.

Each of these tower machines consists of a 100-foot steel tower carried on four sets of Athey tracks. The big 3-drum Sauerman hoist is powered by a General Motors 12V engine. The drums carry a 1⅛-inch drag cable attached to the 5-yard Sauerman Crescent bucket; a ⅞ or ¾-inch pull-back cable also attached to the bucket and reeved through a block on the tail tower; and a ⅞-inch tension cable running from the head tower to the tail tower.

With each rig is a 30-foot structural-steel tail tower mounted on skids. These towers are usually maintained 900 to 1,000 feet out in the reservoir area, while the main towers stand near the edge of the base pad.

As the Crescent scrapers are pulled from the tail tower toward the dike, they bring in considerably more than their 5-yard rated capacity; some 7 or 8 yards of material is dragged in per pass. Because of the high water table, this material is usually wet and sticky and much of it clings to the bucket. The operators usually raise the bucket by tightening the tension line and shake the bucket to dislodge the mud.

Tower machines are moved ahead by a Cat D8 tractor, which hooks onto a pulling cable and walks the machines ahead the desired distance. The cables are slacked off during this operation. At the same time, another D8 moves the tail tower over to a new position.

In the initial stages of this operation, the contractor built up large piles of the material, anticipating that it would drain and dry out in the piles. However, the material did not drain well, and it became difficult to spread, dry, and compact.

Consequently, the operation was revised so that the draglines bring in only small amounts of material, moving ahead frequently to prevent large piles from accumulating. This material is dozed into place and compacted. Then the draglines move back over the area, adding lifts until the required amount of material is accumulated.

A Euclid TC-12 tractor-dozer and several Cat D8's handle the dozing operation, while one D8 with a scarifier helps aerate deposits to speed drying. Another D8 with a sheepsfoot roller handles the compaction. The material is spread and compacted in 6-inch layers.

The dragline crews work around the clock on three shifts, six days per week. The Phase II operation is scheduled for completion in March, 1962.

### Personnel

Clinton D. Woods, project manager for the Weber Basin Project of the Bureau of Reclamation, has supervision over the construction and operation of the entire project. Earl C. Christensen is project construction engineer. On the construction of Willard Dam, W. R. Hardy is the resident engineer.

Supervising the work for Brewster on the Phase II operation is a staff headed by project manager A. J. Seamon and including assistant project manager F. W. Engelman, project superintendent Guy Kachel, and chief clerk G. J. Dunleavy. For Hasler-Smith on the Phase I earthwork, R. R. "Dick" Smith was project manager, with Mel Newman and Jack Brock serving as superintendents.

THE END


# Q: "Why don't they use a heavier-gage pipe?"
# A: "Don't need to. They take advantage of Beth-Cu-Loy sheet steel's flexibility."

Drainage pipe made of Beth-Cu-Loy corrugated sheet steel does look light enough to crumple beneath the weight of passing traffic. Fact is, though, that its very thinness is the key to Beth-Cu-Loy's success in drainage structures.

**Load distributed around pipe**

In short, a Beth-Cu-Loy pipe has transverse flexibility which enables the pipe to enlist the aid of the surrounding material to support imposed loads. Instead of the pressure being exerted solely through the vertical axis of the pipe, it moves into, and compacts, the trench walls. In this way, the load is evenly distributed around the periphery of the pipe.

Drainage pipe made of Beth-Cu-Loy sheets is strong because it's *steel;* durable, because it has a heavy coating of corrosion-resisting zinc. It is light enough for easy installation, and flexible enough to conform to variations in grade and alignment. It conforms in every way to the specs of the AASHO.

**Send for 80-page booklet**

If you would like full details about Beth-Cu-Loy sheets for drainage structures, you will find just about everything you need in our 80-page Booklet 425-B, "Solving Drainage Problems." Ask your pipe fabricator for a free copy, or write direct to us.

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For more facts, use Request Card at page 18 and circle No. 355

# Labor Review

### *All-out organizing drive by building trades promised by Haggerty*

President C. J. Haggerty of AFL-CIO's Building Trades Department told the New York Building Congress that the building trades unions are "determined to organize as they have never organized before" to unionize all construction in every section of the country—whether it is industrial, public, or residential.

Haggerty declared that the main trouble in establishing cooperative labor-management relations on a national basis in the construction industry is "destructive competition from nonunion employers—from contractors who underbid by cutting wages and tearing down working conditions."

### *San Diego concrete drivers end 6-week strike; get 40 cents over two years*

Drivers and laborers returned to work for members of the San Diego County Rock Products Association after a 6-week strike that was settled for a new agreement raising hourly rates 40 cents over two years. According to union sources, about 1,000 workers are covered.

Wage rates were increased 20 cents an hour immediately, and 20 cents more is due August 16, 1961. In addition, the settlement reduces vacation eligibility requirements from 1,250 to 1,000 hours a year and guarantees two hours' show-up pay, six hours' pay if employees start work, and eight hours' pay if employees work more than six hours, the unions report. Employees get one week of vacation after one year and two weeks after two years.

New rates run as follows:

Drivers, 3-yard capacity and under, $3.02; six yards and under, $3.15; over six yards, $3.20

Laborers, $2.77 to $2.98

Refinishers, $3

Powdermen, $3.08

Equipment operators were represented by Teamsters Local 36. Hod Carriers Local 89 bargained for the laborers.

### *New Jersey engineers agree to halt strikes against test-boring firms*

Judge Richard Hartshorne of the United States District Court for New Jersey arranged a stipulation whereby Operating Engineers Local 825 agreed that, pending final disposition of charges by the National Labor Relations Board, it would not try to force two test-boring contractors to assign work to its members rather than to members of Core Drillers Local 1536 of the United Brotherhood of Carpenters.

At issue were job assignment disputes between Local 825 and Warren George, Inc., and Riley Engineering Co. George holds a contract for test borings at the site of a new generating plant being built by the Public Service Electric & Gas Co. at Jersey City; Riley is engaged in taking test borings at the site of a jet airport being constructed at Myersville by the Port of New York Authority.

In both cases, the operating engineers demanded employment of their members on drill boring machines. Both employers have agreements with Local 1536, and both filed jurisdictional strike and secondary boycott charges against Local 825. NLRB moved for a temporary injunction against the engineers.

The stipulation was made after the operating engineers had disrupted an estimated $400 million worth of Public Service work at several sites.

### *Operating engineers announce safety program to cut fatality rate*

The International Union of Operating Engineers announces a 5-point program to reduce the "appalling toll of industrial accidents," featuring an annual award to the employer in the trade with the best safety record of the year.

IUOE president Joseph J. Delaney reports that 220 members of his union were killed by industrial accidents in 1959. The union hopes to cut the rate at least in half in 1961.

Other features of the program are an annual contest among members for the best suggestions for safety on the job; an education program among workers and employers; incorporation of safety regulations into union contracts; and research into the causes and prevention of accidents.

**3½-yd. Lima 1250 shovel** loads blasted rock in Canadian quarry.

## Air-controlled Lima 1250 speeds rock loading

If you want to move more rock faster, easier and more profitably—Lima's the shovel for you!

Take the Lima 1250 as an example. Its main and auxiliary functions are air-controlled for smooth precision performance at full capacity operation. Torque converter, with either Diesel or electric power, reduces shock loading . . . makes heavy digging and rock handling easy on both machine and operator. The type 1250 can be knocked down for over-the-road transfer from job to job.

All Limas can be depended upon to boost profits, because they are top-quality machines designed and built to outperform other makes.

This also results in consistently high production with a minimum of downtime and years of trouble-free, low maintenance service.

There's a Lima type and size for every pit and quarry operation. Shovels to 8 cu. yds., draglines variable. Limas easily convert to cranes—up to 140 tons on crawlers. Choice of power; crawler, wagon or truck mounted.

It won't cost a cent to investigate Limas before you buy your next shovel or dragline—and it might pay off handsomely in increased profits and reduced maintenance costs. Talk to Lima owners. Ask for facts and figures from your nearby Lima distributor or write to Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

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Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment

For more facts, use Request Card at page 18 and circle No. 356

# NEW ROCK-LOADING TEAM BOOSTS PLANT PRODUCTION 25%

Hauler: *13-ton Michigan Tractor Wagon* Loader: *2¾ yd Michigan Tractor Shovel*
Output: *2,400 tons daily on 2 mile cycle*

Four years ago, the Fort Scott Hydraulic Cement Company, Fort Scott, Kansas, began a program to replace their four crawler-loaders and two 10-ton tandem-axle dump trucks with the most modern equipment available.

The program was completed when a 13-ton rear-dump Michigan Tractor Wagon went on the job a year ago. Its addition gave Fort Scott, one of the nation's three major natural cement producers, an all Michigan fleet. The Wagon teams with a 2¾ yd Model 175A Michigan Tractor Shovel in the rock pit. Three other 2¾ yd Michigan Tractor Shovels handle the crushed rock, coal, and clinkers in this 4,500 barrel-a-day natural cement plant.

### Tractor Wagon hauls 120 tons per hour

It's the heavy rock loading and hauling operation that Mr. Pat Thomas, president of the 92-year-old firm, points to as being the best example of how the Michigan machines have improved job efficiency.

Shot Florentine limestone is currently being loaded out of the far end of a pit 90 feet wide and 5,000 to 6,000 feet long. This makes the average haul cycle, between pit and crusher, about two miles.

The 162 hp Tractor Wagon's stability and speed of up to 31 mph is a prime production factor in the mile long *uphill* run from pit to crusher. With torque converter and full power shift, power and speed are instantly adjusted to match the load demand.

On two 10-hour shifts, the Tractor Wagon, sideboarded to meet rated capacity, and the highly-maneuverable 2¾ yd Tractor Shovel will load out an average 2,400 tons of rock . . . rock which weighs, when loose, approximately 2,500 lbs per cu yd.

### 2 Michigans outwork 3 units formerly used

Production in the rock pit has risen 25% since the Tractor Shovel replaced a crawler rig with similar bucket capacity, and the Tractor Wagon took over the job formerly handled by two 10-ton dump trucks.

For more facts, use Request Card at page 18 and circle No. 357

### Upkeep "phenomenally small," says president

"With all five of the Michigans working constantly with heavy loads and over sharp rock and abrasive cinders, *we have spent less than $2100 on overhauls, parts, tires and labor during the past three years,*" says Mr. Thomas. "I think this figure is extremely low considering what a machine goes through in a cement plant operation of this type. We've had virtually no downtime."

If you're hauling bulky materials off the highway, perhaps a Michigan Tractor Wagon could increase your production, too. When you pair it with one of the eight Michigan Tractor Shovel models (up to 6 cu yds), you've got a team that can't be beat. Let us demonstrate. Just call. There's no obligation, of course.

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